AND
RIEFS.

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No. 15-680

IN THE

Supreme Court of the United States

GOLDEN BETHUNE-HILL, CHRISTA BROOKS, CHAUNCEY BROWN, ATOY CARRINGTON, DAVINDA DAVIS, ALFREDA GORDON, CHERRELLE HURT, THOMAS CALHOUN, TAVARRIS SPINKS, MATTIE MAE URQUHART, VIVIAN WILLIAMSON, AND SHEPPARD ROLAND WINSTON,

Appellants,

v.

VIRGINIA STATE BOARD OF ELECTIONS, *ET AL.*,

Appellees.

On Appeal from the United States District Court for the Eastern District of Virginia

JOINT APPENDIX

VOLUME III

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Log of conversion of roll call vote from text download for rc02

HB 5005 House of Delegates and Senate districts; changes in boundaries. floor: 04/07/11 House: VOTE: BLOCK VOTE PASSAGE #2 (80-Y 9-N)

756 YEAS–Abbitt; Albo; Alexander; Anderson; Athey; BaCote; Bell, Richard P.; Bell, Robert B.; Brink; Bulova; Byron; Carr; Carrico; Cleaveland; Cline; Cole; Comstock; Cosgrove; Cox, J.A.; Cox, M.K.; Crockett-Stark; Dance; Edmunds; Englin; Filler-Corn; Garrett; Gilbert; Greason; Habeeb; Helsel; Herring; Howell, A.T.; Hugo; Taguinto; Ingram; James; Janis; Joannou; Johnson; Jones; Keam; Kilgore; Knight; Kory; Landes; LeMunyon; Lewis; Lingamfelter; Loupassi; Marshall, D.W.; Marshall, R.G.; Massie; May; McClellan; Merricks; Miller, J.H.; Morefield; Morgan; Nutter; O'Bannon;

Oder; Orrock; Peace; Pogge; Poindexter; Purkey; Putney; Robinson; Rust; Scott, E.T.; Scott, J.M.; Sherwood; Sickles; Spruill; Stolle; Surcvell; Tata; Torian; Tyler; Villanueva; Ward; Ware, O.; Ware, R.L.; Watts; Wilt; Wright; Mr. Speaker–80.

85 NAYS–Abbott; Ebbin; Hope; Johnson; Miller, P.J.; Morrissey; Toscano; Tyler; Ward–9.

112 NOT VOTING–Armstrong; Cleveland; Cox; J.A.; Edmunds; Greason; Knight; Kory; Oder; Pollard; Purkey; Shuler–11.

GROUP	YEAS	NAYS	NONE	OTHER
ALL	80	9	11	0
ELK	11	2	0	0
REP	52	0	7	0
DEM	26	0	4	0

Members voting NO

ED	PTY	MNF	RCO1	TRTM(Inf)
4	Dem		2	Johnson, Joseph P., Jr.
47	Dem		2	Hope, Patrick A.
49	Dem		2	Ebbin, Adam P.
57	Dem		2	Toscano, David J.
74	Dem		2	Morrissey, Joseph D.
75	Dem	B	2	Tyler, Roslyn C.
87	Dem		2	Miller, Paula J.
92	Dem	B	2	Ward, Jeion A.
93	Dem		2	Abbott, Robin A.

Log of conversion of roll call vote from text download for rc03

HB 5005 House of Delegates and Senate districts; changes in boundaries. floor: 04/28/11 House: VOTE: BLOCK VOTE PASSAGE #2 (63-Y 7-N)

594 YEAS–Abbitt; Albo; Alexander; Anderson; Athey; BaCote; Bell, Richard P.; Bell, Robert B.; Brink; Bulova; Byron; Carr; Carrico; Cleaveland; Cline; Cole; Comstock; Cosgrove; Cox, J.A.; Cox, M.K.; Crockett-Stark; Dance; Edmunds; Englin; Filler-Corn; Garrett; Gilbert; Greason; Habeeb; Helsel; Herring; Howell, A.T.; Hugo; Taguinto; Ingram; James; Janis; Joannou; Johnson; Jones; Keam; Kilgore; Knight; Kory; Landes; LeMunyon; Lewis; Lingamfelter; Loupassi; Marshall, D.W.; Marshall, R.G.; Massie; May; McClellan; Merricks; Miller, J.H.; Morefield; Morgan; Nutter; O'Bannon;

Oder; Orrock; Peace; Pogge; Poindexter; Purkey; Putney; Robinson; Rust; Scott, E.T.; Scott, J.M.; Sherwood; Sickles; Spruill; Stolle; Surcvell; Tata; Torian; Tyler; Villanueva; Ward; Ware, O.; Ware, R.L.; Watts; Wilt; Wright; Mr. Speaker–80.

69 NAYS–Abbott; Ebbin; Hope; Miller, P.J.; Morrissey; Toscano; Ward–9.

290 NOT VOTING–Abitt; Armstrong; Byron; Carrico; Cleveland; Cox; J.A.; Crockett-Stark; Dance; Englin; Greason; Ingram; Johnson; Kilgore; Knight; Kory; Landes; Marshall; R.G.; Nutter; O'Bannon; Oder; Plum; Poindexter; Pollard; Purkey; Scott;

J.M.; Sherwood; Shuler; Torian; Tyler; Wright;–30.

GROUP	YEAS	NAYS	NONE	OTHER
ALL	63	7	30	0
ELK	9	1	3	0
REP	41	0	18	0
DEM	21	7	11	0

Members voting NO

ED	PTY	MNF	RCO1	TRTM(lnf)
47	Dem		2	Hope, Patrick A.
49	Dem		2	Ebbin, Adam P.
57	Dem		2	Toscano, David J.
74	Dem		2	Morrissey, Joseph D.
87	Dem		2	Miller, Paula J.
92	Dem	B	2	Ward, Jeion A.
93	Dem		2	Abbott, Robin A.

TRIM (f1)

Delegate Peace stated that he objected to the redistricting plans for Senate Districts 4, 9, and 12 in Hanover County.

Delegate Armstrong recorded as not voting. Intended to vote nay.

Delegate Ingram recorded as not voting. Intended to vote yea.

Delegate Landes recorded as not voting. Intended to vote yea.

Delegate Plum recorded as not voting. Intended to vote yea.

(HB5001)

GOVERNOR'S VETO

April 15, 2011

TO THE HOUSE OF DELEGATES:

HOUSE BILL NO. 5001

House Bill 5001 includes decennial redistricting plans for the House of Delegates and Senate of Virginia, as required by Article II, Section 6 of the Constitution of Virginia. Upon reviewing the plans and relevant state and federal law, I have several legal and other concerns with this legislation. Specifically, there are significant issues with the Senate reapportionment plan ("Senate Plan") that prevent me from signing the bill in its current form. While 1 applaud the House for its bipartisan approach, I encourage the House to pursue opportunities that will strengthen its plan.

First, it is apparent that districts proposed in the Senate plan are not compact, as required in the Constitution of Virginia, and do not properly preserve locality lines and communities of interest. These issues were noted in the Independent Bipartisan Advisory Commission on Redistricting ("Bipartisan Commission") report as the most significant concerns of the citizens of Virginia. The Constitution of Virginia requires that electoral districts be composed of "compact territory." This requirement is also contained in the resolution adopted by the Senate Privileges and Elections Committee on March 25, 2011. Using the most commonly recognized tools of compactness scoring, the Reock and Polsby-Popper methods, the plan adopted by the Senate has less compact districts than the existing House or Senate

districts or other plans that have been proposed. The Senate Committee resolution also requires that communities of interest be respected, including local jurisdiction lines. While the House plan keeps the number of split localities relatively static, the Senate plan significantly increases the number of times localities are split as compared to either other proposed plans or the current redistricting law (from 190 to 198 in the House plan (4% change), contrasted with an increase of 108 to 135 in the Senate plan (25% change)). A plain visual examination of the districts in the Senate plan also place into serious doubt that the compactness and communities of interest requirements have been met. As Justice Stevens said in the 1983 U.S. Supreme Court case of *Karcher v. Daggett*, "Drastic departures from compactness are a signal that something may be amiss."

Second, I am concerned that the Senate plan may violate the one person- one vote ideal embodied in the United States and Virginia Constitutions. The Fourteenth Amendment of the United States Constitution provides for equal protection of the laws. This has been interpreted to require that state legislative districts have as close to equal representation as practicable, taking into consideration other important and legitimate redistricting factors. Additionally, Article II, Section 6 of the Constitution of Virginia requires that districts be drawn in a manner to "give, as nearly as is practicable, representation in proportion to the population of the district." The House plan has a deviation of only ± 1 percent. However, in reviewing the districts proposed in the Senate plan, they appear to deviate from the one person-one vote standard without any apparent legitimate justification. While the deviation from the ideal district is smaller than in past decennial redistricting cycles,

deviations must be justified with achieving some recognized principle of redistricting such as preserving local jurisdictional lines, creating compact districts, or maintaining communities of interest. Additionally, as the Bipartisan Commission noted, "the tradition in the Commonwealth has been to require a stricter population standard than allowed by the federal courts." After close review of the Senate plan, I cannot identify any apparent justification for the deviations proposed. In fact, the Senate plan systematically underpopulates districts in slow-growth regions of the state (urban and rural) while overpopulating districts in high-growth areas of the Commonwealth (suburban).

Lastly, I am concerned that the Senate plan is the kind of partisan gerrymandering that Virginians have asked that we leave in the past. The House of Delegates passed its plan on an overwhelming 86-8 vote, with twenty-eight affirmative votes from members of the minority party. Similarly, in 2001, both the House and Senate plans passed with bipartisan support. In stark contrast, the Senate plan failed to garner any votes in the Senate from the minority party. Certainly, the Senate can create a plan that will be supported by a bipartisan majority of Senators, especially with the Senate's overwhelming support for a bipartisan redistricting process as expressed in previous legislation.

In conclusion, after a careful review of the Senate plan, I have serious concerns that such a plan may violate state and federal law and could potentially subject Virginia to costly and unnecessary litigation. Time is of the essence to ensure that we maintain control over a process that drastically impacts Virginians for years to come. I encourage you to

reevaluate this legislation in light of these expressed concerns and begin work immediately to develop a plan that is clearly lawful and can ensure bipartisan support. It is imperative that your work commence and be completed promptly to permit the appropriate preclearance process to occur so that the election can proceed as currently scheduled.

Accordingly, pursuant to Article V, Section 6, of the Constitution of Virginia, I veto this bill.

HB 5001 House of Delegates and Senate districts; changes in boundaries.

S. Chris Jones | all patrons . . . notes | add to my profiles

Summary as passed House: (all summaries)

House of Delegates and Senate districts. Redraws the boundaries of the 100 House districts and 40 Senate districts.

Full text:

03/29/11	House: Presented and ordered printed 11200024D pdf
03/31/11	House: Introduced bill reprinted 11200024D pdf
04/04/11	House: Committee substitute printed 11200054D-H1 pdf
04/07/11	Senate: Committee substitute printed 11200095D-S1 pdf
04/07/11	Senate: Floor substitute printed 11200098D-S2 (Watkins) pdf
04/11/11	House: Conference substitute printed 11200112D-H2 pdf
04/12/11	House: Bill text as passed House and Senate (HB5001ER) pdf

Amendments:

Senate amendments

Senate amendments engrossed

Conference amendments

Governor's veto explanation

Status:

03/29/11	House: Presented and ordered printed 11200024D
03/29/11	House: Referred to Committee on Privileges and Elections
03/31/11	House: Introduced bill reprinted 11200024D
04/04/11	House: Reported from Privileges and Elections with substitute (20-Y 2-N)
04/04/11	House: Committee substitute printed 11200054D-H1
04/04/11	House: Read first time
04/05/11	House: Read second time
04/05/11	House: Committee substitute agreed to 11200054D-H1
04/05/11	House: Engrossed by House - committee substitute (87-Y 10-N) HB5001H1
04/05/11	House: VOTE: ENGROSSMENT (87-Y 10-N)
04/06/11	House: Read third time and passed House (84-Y 9-N)
04/06/11	House: VOTE: PASSAGE (84-Y 9-N)
04/06/11	House: Reconsideration of passage agreed to by House
04/06/11	House: Passed House (86-Y 8-N)
04/06/11	House: VOTE: PASSAGE #2 (86-Y 8-N)
04/07/11	Senate: Constitutional reading dispensed

04/07/11	Senate: Referred to Committee on Privileges and Elections
04/07/11	Senate: Reported from Privileges and Elections with substitute (9-Y 6-N)
04/07/11	Senate: Committee substitute printed 11200095D-S1
04/07/11	Senate: Floor substitute printed 11200098D-S2 (Watkins)
04/07/11	Senate: Read second time
04/07/11	Senate: Rules suspended
04/07/11	Senate: Constitutional reading dispensed (40-Y 0-N)
04/07/11	Senate: Committee substitute agreed to (22-Y 18-N) 11200095D-S1
04/07/11	Senate: Floor Substitute by Senator Watkins not in order
04/07/11	Senate: Amendments by Senator Howell agreed to
04/07/11	Senate: Engrossed by Senate - committee substitute HB5001S1
04/07/11	Senate: Passed Senate with substitute with amendments (22-Y 18-N)
04/08/11	House: Placed on Calendar
04/11/11	House: Senate substitute with amendments rejected by House (0-Y 93-N)
04/11/11	House: VOTE: ADOPTION (0-Y 93-N)
04/11/11	Senate: Senate insisted on substitute with amendments (32-Y 5-N)

04/11/11	House: House acceded to request
04/11/11	House: Conferees appointed by House
04/11/11	House: Delegates: Jones, Bell, R.B., Dance
04/11/11	Senate: Senate acceded to request
04/11/11	Senate: Conferees appointed by Senate
04/11/11	Senate: Senators: Howell, Blevins, Barker
04/11/11	House: Conference substitute printed 11200112D-H2
04/11/11	Senate: Conference report agreed to by Senate (22-Y 17-N)
04/11/11	House: Conference report agreed to by House (85-Y 9-N)
04/11/11	House: VOTE: ADOPTION (85-Y 9-N)
04/12/11	House: Enrolled
04/12/11	House: Bill text as passed House and Senate (HB5001ER)
04/12/11	House: Signed by Speaker
04/12/11	Senate: Signed by President
04/15/11	Governor: Vetoed by Governor
04/25/11	House: No action taken

https://leg1.state.va.us/cgi-bin/legp5. . .

HB 5005 House of Delegates and Senate districts; changes in boundaries.

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Summary as passed House: (all summaries)

House of Delegates and Senate districts. Redraws the boundaries of the 100 House and 40 Senate districts.

Full text:

04/18/11	House: Presented and ordered printed 11200131D pdf
04/28/11	Senate: Committee substitute printed 11200181D-S1 pdf
04/29/11	House: Bill text as passed House and Senate (HB5005ER) pdf Governor:
4/29/11	Acts of Assembly Chapter text (CHAP0001) pdf

Amendments:

Senate amendments

Senate amendments engrossed

Status:

04/18/11	House: Presented and ordered printed 11200131D
04/18/11	House: Referred to Committee on Privileges and Elections
04/18/11	House: Reported from Privileges and Elections (16-Y 0-N)
04/18/11	House: Read first time

04/25/11	House: Read second time and engrossed
04/27/11	House: Read third time and passed House (80-Y 9-N)
04/27/11	House: VOTE: BLOCK VOTE PASSAGE (80-Y 9-N)
04/27/11	Senate: Constitutional reading dispensed
04/27/11	Senate: Referred to Committee on Privileges and Elections
04/28/11	Senate: Reported from Privileges and Elections with substitute (12-Y 3-N)
04/28/11	Senate: Committee substitute printed 11200181D-S1
04/28/11	Senate: Read second time
04/28/11	Senate: Constitutional reading dispensed (37-Y 0-N)
04/28/11	Senate: Reading of substitute waived
04/28/11	Senate: Committee substitute agreed to 11200181D-S1
04/28/11	Senate: Reading of amendments waived
04/28/11	Senate: Amendments by Senator Barker agreed to
04/28/11	Senate: Engrossed by Senate - committee substitute with amendments HB5005S1
04/28/11	Senate: Passed Senate with substitute with amendments (32-Y 5-N)
04/28/11	House: Placed on Calendar

04/28/11	House: Senate substitute with amendments agreed to by House 11200181D-S1 (63-Y 7-N)
04/28/11	House: VOTE: ADOPTION (63-Y 7-N)
04/29/11	House: Enrolled
04/29/11	House: Bill text as passed House and Senate (HB5005ER)
04/29/11	House: Signed by Speaker
04/29/11	Senate: Signed by President
04/29/11	Governor: Approved by Governor-Chapter 1 (effective 04/29/11)
04/29/11	Governor: Acts of Assembly Chapter text (CHAP0001)

https://leg1.state.va.us/cgi-bin/legp. . .

IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF VIRGINIA
(RICHMOND DIVISION)

Civil Action No. 3:14-cv-00852-REP-GBL-BMK

GOLDEN BETHUNE-HILL, *et al.*,

Plaintiffs,

v.

VIRGINIA STATE BOARD OF ELECTIONS, *et al,*

Defendants.

DECLARATION OF THOMAS BROOKS HOFELLER, Ph.D.

1. I am a recognized expert in the fields of districting and reapportionment in the United States. I have been retained, as an independent consultant, through counsel by Intervenor-Defendants House Speaker William Howell and the Virginia House of Delegates to provide expert testimony in this case. My hourly rate is $300 per hour.

OBJECTIVES OF DECLARATION

2. I have been asked to determine whether H.B. 5005, the legislation enacted in 2011 by the Virginia General Assembly to redistrict Virginia's House of Delegates following the 2010 U.S. Census, is compact and contiguous.

3. Based on my review of the map and data reflecting H.B. 5005, as well as data and maps from other states, and my experience in drafting and evaluating districting plans for compactness all across

the nation for five decennial redistricting cycles, it is my opinion that the 2011 Virginia House of Delegates Plan H.B. 5005 is compact and compares favorably in terms its level of compactness to other Virginia legislative plans and plans from other states.

4. Based on my review of the geography of HB 5005, I have also determined that there are no contiguity issues with regard to the 2011 House of Delegates Plan.

QUALIFICATIONS

5. I set forth here a summary of my experience that is most relevant to this testimony. The full range of my professional qualifications and experience is included in my resume, which is attached as Exhibit 1.

6. I am a Partner in Geographic Strategies, LLC, located in Columbia, South Carolina. Geographic Strategies provides redistricting services including database construction, strategic political and legal planning in preparation for actual line drawing, support services and training on the use of geographic information systems (GIS) used in redistricting, analysis of plan drafts, and actual line-drawing when requested. The corporation and its principals also provide litigation support.

7. I hold a Ph.D. from Claremont Graduate University, where my major fields of study were American political philosophy, urban studies and American politics. I hold a B.A. from Claremont McKenna College with a major in political science.

8. I have been involved in the redistricting process for over 46 years, and have played a major role in the development of computerized redistricting systems, having first supervised the construction of such a system for the California State Assembly in 1970-71.

9. I have been active in the redistricting process leading up to and following each decennial census since 1970. I have been intimately involved with the construction of databases combining demographic data received from the United States Census Bureau with election information which is used to determine the probable success of parties and minorities in proposed and newly enacted districts. Most of my experience has been related to congressional and legislative districts, but I have also had the opportunity to analyze municipal and county-level districts.

10. I served for a year and one half as Staff Director for the U. S. House Subcommittee on the Census in 1998-99.

11. I was Staff Director of the Subcommittee when the Census Bureau was proposing to substitute the American Community Survey (ACS) for the use of the decennial long form questionnaire in the 2000 and previous decennial Censuses. The long faun was not used in the 2010 Decennial Census.

12. I have drafted and analyzed plans in most states including, but not limited to, California, Nevada, Arizona, New Mexico, Colorado, Texas, Oklahoma, Kansas, Missouri, Minnesota, Wisconsin, Illinois, Indiana, Ohio, Arkansas, Mississippi, Louisiana, Alabama, Georgia, Florida, South Carolina, North Carolina, Virginia, New York, New Jersey and Massachusetts.

13. In this decennial round of redistricting, I have already been intensely involved in Texas, Alabama, North Carolina, Virginia and Massachusetts. As much of my consulting activities involve work in states subject to the provisions of Section 5 of the Voting Rights Act, I am very familiar with the data used to

analyze the expected performance of redrawn and newly created minority districts. I regularly advise clients about the characteristics of minority districts in their plans, and whether or not they are meeting the requirements of both Sections 2 and 5 of the Voting Rights Act.

14. I have given testimony as an expert witness in a number of important redistricting cases including, but not limited to, *Gingles v. Edmisten*, 590 F. Supp. 345 (N.D.N.C. 1984), *affd in part and rev'd in part Thornburg v. Gingles* 478 U.S. 30 (1986); *State of Mississippi v. United States*, 490 F. Supp. 569 (D.C.D.C. 1979); *Shaw v. Hunt*, 92-202-CIV-5-BR, U.S. District Court for the Eastern District of North Carolina, Raleigh Division (1993-4); *Ketchum v. Byrne*, 740 F,2d 1398, *cert. denied City Council of Chicago v. Ketchum*, 471 U.S. 1135 (1985), *on remand*, *Ketchum v. City of Chicago* 630 F. Supp. 551 (N.D. III. 1985); and *Arizonans for Fair Representation v. Symington*, CIV 92-0256, U.S. District Court Arizona (1992), *aff'd mem. sub nom. Arizona Community Forum v. Symington*, 506 U.S. 969 (1992), *David Harris v. Patrick McCrory*, Civil Action No. 1:13 CV-00949 (United States District Court, Middle District of North Carolina Durham Division 2013) and *North Carolina State Conference of the NAACP v. Patrick Lloyd McCrory*, 1:13 CV-658 (United States District Court, Middle District of North Carolina 2013).

15. I have done considerable work regarding compactness as a criterion in redistricting maps, including but not limited to a work I coauthored in *The Journal of Politics*, "Measuring Compactness and the Role of a Compactness Standard in a Test for Partisan and Racial Gerrymandering." *Id.*, Vol. 52,

No. 4 (Nov., 1990), pp. 1155-1181 (with Richard G. Niemi, Bernard Grofman, and Carl Carlucci).

16. In that work, my co-authors and I discussed the advantages and limitations of various measures of compactness as well as differing definitions. As we stated in the article, "disputes about compactness will be numerous . . . there are those who would dismiss it outright as well as those who believe in it passionately." We further noted that "whatever turns out to be its utility as a districting standard, we hope that we have sufficiently clarified the concept so as to stimulate more rational, enlightened discussion of its merits and faults as well as further study of its supposed effects."

17. Both prior and subsequent to my coauthorship of the Journal of Politics article, I have regularly advised state legislatures and others regarding the concept of compactness and regarding the compactness of specific districts and districting plans.

SOURCES OF DATA FOR THIS REPORT

18. In compiling the maps, figures and tables for this report, I have accessed current and historic redistricting plan files for multiple states, which I have access through my present and former consulting work, along with other analyses provided by other redistricting information sources available through counsel. All of the compactness measures have been computed using U. S. Census Bureau's TIGER geographic files which contain multiple levels of census geographic units including, but not limited to, census blocks, voting districts (VTD's), census places, and counties as well as congressional and legislative district boundaries. Current and former political district boundaries are coded into attribute files at the census

block level and are commonly referred to as "block assignment files". The geographic boundary information for legislative plans enacted in the decade prior to the 2010 Decennial Census and after that Census is available through U. S. Census Bureau data sources. In some cases actual boundary files for the 1991 Virginia legislative districts have been matched to current census geographic files to "move" block assignment from generated from prior redistrictings into the current 2010 TIGER geography.

19. Compactness tests are an integral part of modem redistricting geographic information systems (GIS) and are part of many analytical reports which can be produced for redistricting plans drafted on a redistricting system. I have used the GIS software developed by Caliper Corporation, located in Newton, Massachusetts. This software package is "Maptitude for Redistricting", and is the most commonly-used software used by redistricting experts across the nation. All the maps used in this report have been produced using Maptitude for Redistricting. The information contained on most of the tables in this report has been compiled from Maptitude reports using Excel, which is a common Microsoft utility spreadsheet software program.

MAKING DETERMINATIONS REGARDING COMPACTNESS

20. Experts in my field are frequently asked by state legislatures or other interested parties to determine whether a map is "compact" under a relevant statutory or constitutional provision. To the best of my knowledge, no state statutes or constitutions define what specific attributes are to be found in a "compact" plan, provide objective tests for measuring the degree to which those attributes are present, or provide

numerical or other objective bright lines for determining whether plans or districts are compact.

21. Compactness is a concept in search of a definition. This is so for two reasons. First, there is not complete agreement among legislators, courts, experts, or the general public about what attributes must or should be present in a "compact" district or an individual redistricting plan. Second, even when specific attributes of compactness are isolated, there are multiple methods of measuring those attributes and there is no general agreement about what minimum measurements are required before a district or plan can be considered compact. Indeed, there is not even agreement that a minimum measurement or bright line should be used for determining whether a given district or plan is compact.

22. Various concepts of compactness can, however, be used to evaluate plans for purposes of comparing one plan to another. These varied concepts are reflected in mathematical tests that attempt to measure the presence of certain attributes. For example, some tests focus on the shape of a district, finding different ways to assign a one-dimensional number to a two-dimensional shape. Some tests focus solely on the perimeter of an area, focusing primarily on intrusions or extrusions and potentially on the size of a district, but not necessarily on how well a district fills in a given area. Other tests focus on population dispersion within a district. Each of these tests rewards certain positive attributes of compactness and penalizes negative attributes.

23. The quantitative scores derived from these tests can be used to make comparisons between plans with respect to certain attributes that the "tester" thinks are important, but they should not be used to

eliminate plans that fail to meet a predetermined level. There is no score for any one measure, much less for all of them, when used together, that, on its face, indicates unsatisfactory compactness. Nor can compactness scores be used to rank all possible plans along a single continuum, from perfectly un-compact to perfectly compact.

24. Despite the inability to meaningfully use mathematical tests in applications beyond a simple comparison between two plans, compactness is not a meaningless concept. For example, while there is no precise temperature that marks the transition from hot to cold, we know that 10 degrees is uniformly regarded as cold and 90 degrees as warm. The same can be said of 30 degrees and 70 degrees and other temperatures closer to the middle, even though there comes a point, not a bright line, where there is no general agreement.

25. In deciding whether a given set of districts are compact, the question that experts ask is not, therefore, whether another plan scores lower or higher using a mathematical test to measure some single attribute of compactness. Instead, experts determine whether the plan is "hot" or "cold;" according to the degree it exhibits the traits of other districting plans that have been determined by legislatures or courts to be compact.

26. For purposes of this report, I have selected two compactness measures which are familiar to courts and widely cited. The first test is called the Reock Test and the second is the Polsby-Popper Test. Both tests are based on the geographic area of a district compared to a calculated circle. Both tests are not affected by the geographic size of the district, or districts, which are being measured.

27. The Reock Test, sometimes described as "Geographic Dispersion Compactness" computes the ratio of the area of a district to the area of the smallest circle that can enclose the district. A "perfectly shaped district' would be a circle for which the area of the district and the circumscribing circle would be the same. The Reock score would be 1.00. Another common geometrically-shaped district would be a square, with a Reock score of 0.6366.

28. The Polsby-Popper Test, sometimes described as "Perimeter Compactness" computes the ratio of the area of a district to the area of a circle with the same perimeter as the district being tested. Once again, a "perfectly shaped" district would be a circle with a score of 1.00. A square-shaped district would have a score of 0.7854.

29. Figure 1 contains examples of three rectangular districts (A, B & C). District A is a square. District B is a rectangle with a width twice as long as its height. District C has a width three times as long as its height. As the rectangle increases in width relative to its height, the Reock score decreases from 0.637 to 0.509 to 0.382. Thus, the Reock test reacts strongly to elongated districts. At the same time, as the rectangle elongates, the Polsby-Popper score decreases from 0.785 to 0.698 to 0.589. The Polsby-Popper score reacts less to the elongation of a district.

30. Figure 2 contains a much more convoluted district with numerous indentations into a basic shape which is almost square. Testing this hypothetical district yields a Reock score of 0.405, but a Polsby-Popper Score of only 0.082, which is much lower. This example illustrates that the Polsby-Popper tests is very sensitive to indentations into the district, or multiple lengthy extrusions. This is the type of

geographic feature which might be caused by water boundaries, such as coastlines or rivers, other mountain ridges. The marked difference between the size of the Reock circle and the Polsby-Popper circle is quite striking in this example.

EXAMPLES OF NON-COMPACT DISTRICTS

31. When Justice O'Connor addressed compactness in *Shaw vs. Reno (517* U.S. 899 (1995)), she was looking at the districts found on Map 1 of this report. These districts were North Carolina's second attempt to draft a congressional districting plan, following the 1990 Decennial Census, which would receive preclearance from the United States Department (DOJ) under Section 5 of the Voting Rights Act. Enacted in 1992, Congressional District 12 was particularly cited by Justice O'Connor as being bizarre in shape. District 12 was declared unconstitutional. It should be noted that District 12 had a Reock Score of 0.05 and a Polsby-Popper Score of 0.01. Congressional District 1, which is an example of lack of compactness, had a Reock score of 0.26 and a Polsby-Popper score of 0.02. The reason that District 1's Reock score is higher than District 12 is that its width is closer to its length. Both districts are only contiguous by touch, which is not considered to be contiguous in many states, including present-day North Carolina. The compactness scores for the 1992 North Carolina congressional map are listed on Table 1.

32. After North Carolina's 1992 Congressional Plan was tossed out by the Court, the State went through several maps while attempting to gain court approval of its post-1990 Decennial Census congressional map. The final map, passed in 1997 was finally approved by the United States Supreme Court *(Hunt v. Cromartie*

526 U.S., 541 (1999)), and only used in the 2000 Election.

33. In the congressional remap following the 2000 Decennial another map was enacted in 2001 which was in effect through the 2010 General Election. This map, shown on Map 2, shows how Districts 1 and 12 changed though the next redistricting cycle. District 12 had a Reock score of 0.12 and a Polsby-Popper score of 0.03 while District 1 had a Reock score of 0.39 and a Polsby-Popper score of 0.08. In the period from 1992 through 2010 both Districts 1 and 12 elected African-Americans. The compactness scores for the 2001 plan are found in Table 13.

34. The state of Illinois also contains some strangely configured districts which have been crafted to protect minority incumbents from the Chicago area. Illinois has been steadily losing congressional representation for many decades, leaving the Chicago districts severely underpopulated. Map 3 shows the four minority districts anchored in Chicago. The Reock and Polsby-Popper scores for Illinois' 2011 congressional districts are found on Table 2. All these districts contain minority voting-age population (VAP) percentages in excess of 60% in terms of 2010 Decennial Census numbers. The African-American districts are 1, 2, and 7. District 4 is a carefully crafted to separate the Hispanic population from the African-American population, with a Hispanic VAP of 65.92%. District 2 extends from Southeast Chicago, through the southeast Chicago suburbs, through eastern Will County out into Kankakee County. District 1 begins with a narrow neck coming out of Chicago, into the Cook County suburbs and out into western Will County. District 7 is based in Chicago. It has an extension off the main body of the District to the south

side of Chicago connected through a narrow passage just over 500 feet wide. The 7th District also extend west out into Cook county to come within 300 feet of the Cook County-DuPage County line. District 4 is the Hispanic congressional seat which is known by almost all redistricting experts as the "Earmuff District". It carefully wraps around African-American District 7 running between the western boundary of the 7th District and the DuPage County boundary.

35. I have drawn these districts to the attention of the court because they were clearly crafted with only two goals. First was to create three African-American districts and one Hispanic district. They were drawn to add needed population into seriously underpopulated minority districts and were totally race-based in motivation. The second goal was to create three safe seats for Non-Hispanic White Democrats. Congressional Districts 3, 5 and 9, which also are based in Chicago, have Non-Hispanic White VAP populations in excess of 65% and have successfully elected Non-Hispanic White Democrats.

36. In *King v. State Bd. of Elections* (979 F.Supp. 619 (N.D. III. 1997) *(King II),* the court found that, while the Illinois 4th District was irregularly shaped, it was still compact and maintained most of the other traditional redistricting criteria in Illinois. The odd shape was in fact necessitated because of the need to accommodate an existing African-American incumbent. As a result, the court found that the district, which has commonly been referred to as an "earmuff," met the compactness prong of *Gingles* and was therefore narrowly tailored.

37. Unfortunately, real districts cannot be drawn to conform to basic geometric shapes. This is especially true for the state of Virginia, which is irregularly shaped to begin with. Theoretically, states such as Colorado or Wyoming might be divided into simple square or rectangular districts except that, even in these states, the units of geography, which are combined into districts, are not regularly shaped.

38. Virginia has 7,213 miles of tidal bay frontage, 123 miles of ocean coastline, and 457 miles of on-tidal river frontage. Many county lines follow riverbeds, and the State's western boundary runs along over 400 miles of mountain ridges and rivers. All of these physical features would affect some compactness tests, especially the Polsby-Popper test.

39. Virginia's Tidewater region, which runs from the fall line to the Chesapeake Bay, is divided into four major regions by the James, York and Rappahannock Rivers. The boundaries of Virginia's counties in the Tidewater are shaped by these rivers which were historic avenues of transportation in Virginia.

40. Other factors affecting district shapes are the federal constitutional requirement of equality of population and the requirements of the Federal Voting Rights Act of 1965, as amended. Areas of minority population may not be located in geographic configurations which lend to their inclusion in optimally-compact districts. A state redistricting authority might have to balance other competing redistricting goals against the shapes of districts to draft feasible plans. In Virginia, the Legislature has been afforded considerable latitude in making these policy decisions by the State Supreme Court.

41. Another competing factor is the protection of incumbency interests and maintenance of district core area from one redistricting plan to another. This is equally true for African-American incumbents. In my 45 years of redistricting experience, I have found that most incumbents are unlikely to happily exchange safe districts for more competitive districts, and that also includes minority incumbents.

42. Relative shifts in the balance of population between areas of a state require difficult policy choices. The overriding factor in creating a new districting plan is that, as is the case of Virginia, the map must be enacted by the same legislators who will represent the new districts. If enough legislators do not accept the map, there will be no bill enacted.

43. In my expert opinion, there is no clear national standard or bright line test with which to say that Virginia's current districts meet some theoretical academic standard of permissible compactness. However, Virginia does have a state constitutional provision on compactness, and there are two state Supreme Court decisions which provide considerable guidance and define the compactness standard for Virginia legislative districts. These standards were cited by the House of Delegates a part of their redistricting criteria. See *Jamerson v. Womack*, 244 Va. 506 (1992) and *Wilkins v. West*, 264 Va. 447 (2002). This means that Virginia has a better defined compactness standard than most states. While I leave the legal implications of these cases for the attorneys, it is instructive to examine the facts approved by the Virginia Supreme Court.

44. In *Jamerson,* the Virginia Supreme Court upheld the chancellor's court's determination that reapportionment of Senatorial Districts 15 and 18, as

enacted in Chapter 18 of the Acts of the 1991 Special session of the General Assembly (Code §§ 24, 1-17, 19 and 22), did not violate Article II, §6 of the Virginia Constitution with regard to compactness (See Map 12).

45. The Supreme Court further concluded that proper deference must be given to the wide discretion accorded to the General Assembly in its value judgment of the relative degree of compactness required when reconciling the multiple concerns of apportionment.

46. In *Wilkins v. West,* plaintiffs made a complaint under the State Constitution which mirrors the complaint in this case. The circuit court found for the plaintiffs and determined that the districts did not meet the Virginia Constitution's requirements for compactness and contiguity and found that several of the districts were racially gerrymandered. The Virginia Supreme Court unanimously reversed, finding that all the districts complied with the Virginia constitutional regard compactness and contiguity and, therefore, none of the districts constituted a racial gerrymander.

47. In my expert opinion, the *Jamerson* and *Wilkins* standard of value judgment is clearly satisfied by the evidence cited below. I measured the compactness of Senate Districts 15 and 18 as enacted in 1991 as well as the compactness of all the districts in the 1991 State Senate and 1991 House of Delegates Maps. I will compare the information for the 1991 redistricting plans for both chambers as well as the House of Delegates plans drafted following the Decennial Censuses of 2000 and 2010. Particular attention will be given to the current districting plan for the House of Delegates enacted following the 2010 Decennial Census.

48. In order to give the court a frame of reference, I have also determined the compactness scores for other Southern states which face the same issues of minority representation.

49. I will also discuss the issue of district contiguity and note some of the reasons that the districts under contention in this case were enacted in their present configuration. Although I did not participate in the drafting of any Virginia redistricting plans this decade, my 45 years of redistricting experience across the nation give me good perspective of the drafter's motivations just from a detailed examination of the district configurations of a redistricting map.

THE 1991 VIRGINA STATE HOUSE AND SENATE PLANS

50. Table 6 contains the compactness scores for all the senate districts enacted in 1991. Both the Reock and Polsby-Popper scores are listed. At the bottom of the table the minimum district score, the maximum district score and the mean district score are shown. Map 12 shows the boundaries of Senate Districts 15 and 18. The Reock and Polsby-Popper score for District 15 are 0.23 and 0.10 respectively and the equivalent score for District 18 are 0.12 and 0.10. For the 1991 Senate Plan as a whole the lowest Reock score was 0.12 (District 18) and the highest Reock score was 0.65 (District 21). In the 1991 Senate Plan as a whole the lowest Polsby-Popper score was 0.10 (Districts 2, 15, 18) and the highest Polsby-Popper score was 0.43 (District 19). It should be noted that District 16 in that plan had a lower Polsby-Popper score of 0.09 (See Map 15) than the two senate districts specifically cited in *Jamerson*. In my judgment, District 16 is somewhat more bizarre shaped, but because its width is closer to its height it received a better Reock score of 0.33. This

demonstrates the problem of just using these mathematical scores to evaluate compactness.

51. The 1991 House of Delegates District 74 was also among the districts examined in *Jamerson* which is important because very similar shapes for this district were adopted in 2001 and 2011 (See Map 19). The 1991 district had a Reock score of 0.14 and a Polsby-Popper score of 0.11. The Virginia Supreme Court did not object to this district (See Table 5). Almost the exact same district was carried over to the 2001 House Plan (See Map13) and then again into the 2011 House Plan (See Map 8). House District 74 in the 2011 Plan had a Reock score of 0.16 and a Polsby-Popper Score of 0.12. Both compactness scores for the 2011 version of House District 74 were better for that same district than in the 1991 Plan.

52. I have included Map 21 which shows examples of 4 additional 1991 House of Delegates districts. These are districts which the *Jamerson* court examined and approved.

53. It should follow, therefore, that if the compactness scores of the 2011 Virginia House of Delegates Plan are not significantly different than the scores accepted by the Virginia Supreme Court in *Jamerson,* then they are compact enough to pass muster under the Virginia Constitution as drawn in the 2011 House of Delegates Plan.

THE 2011 HOUSE OF DELEGATES PLAN (H.B. 5005)

54. I have compiled Maps 4 through 6 which highlight the 12 African-American districts contained in the 2011 House of Delegates Plan (HB5005). District 75 is rural in character and runs along the Virginia-North Carolina border from Franklin City in the east,

to Brunswick County in the west. District 63 stretches from Hopewell City in the northeast through a portion of Prince George County, though Petersburg and a portion of Chesterfield County and out into northern Dinwiddie County. Only a very small portion of the District's population is rural – about 8,000 out of 79,600. Map 4 is the only map which shows District 75 in its entirety.

55. The four African-American districts in the Norfolk-Portsmouth-Chesapeake area (Districts 77, 80, 89 and 90), along with the two African-American districts in the Hampton-Newport News area (Districts 92 and 95), are shown in greater detail on Map 5. District 77 extends out to the southwest into Suffolk County.

56. The remaining four African-American districts, shown on Map 6, are located in the Richmond-Henrico County area (Districts 69, 70 71 and 74). District 74 extend to the southeast to include all of Charles City County which, it should be noted only contains 7,256 people, living in two precincts.

57. Map 16 shows HB5005 in its entirety with insets for the areas running from Richmond to Hampton Roads along as well as an inset for the Northern Virginia districts.

58. Tables 5 though 10 contain the Reock and Polsby-Popper compactness scores for the following current and historical Virginia Senate and House of Delegates Plans.

a. Table 5 – 1991 State House Plan

b. Table 6 – 1991 State Senate Plan

c. Table 7 – 2001 State House Plan

d. Table 8 – 2001 State Senate Plan

e. Table 9 – 2011 State House Plan

f. Table 10 – 2011 State Senate Plan

59. The compactness scores for the districts of the redistricting plans of the Virginia General Assembly following the last three Decennial Censuses are summarized on Table 3. This table lists the minimum, maximum, mean and standard deviation score for both the Reock Test and the Polsby-Popper Test. The 1991 compactness scores for the 1991 State Senate Plan which was the subject of the *Jamerson* litigation are shaded red and the scores for the current (2011) House of Delegates Plan are shaded green.

60. Comparing the compactness scores for these two shaded plans on Table 3 is the most relevant to determine if the 2011 House map meets the *Jamerson* standard. The Reock scores for these two maps are, essential the same. The lowest Reock score for the 2011 House Plan of 0.14 is 0.02 higher than the lowest score for 1991 Senate Plan (0.12). The highest score for the 2011 House Plan (0.62) is only 0.01 lower than the highest score for the 1991 Senate Plan (0.63). The mean scores for the two maps are the same (0.36), as is the standard deviations (0.11).

61. The Polsby-Popper scores for these two maps are, essentially the same or better. The lowest Polsby-Popper score for the 2011 House Plan of 0.08 is 0.01 lower than the lowest score for 1991 Senate Plan (0.09). The highest score for the 2011 House Plan (0.55) is 0.12 greater than the highest score for the 1991 Senate Plan (0.43). The mean scores for the two maps are the same (0.24), and the standard deviation for the 2011 House Plan (0.09) is 0.01 lower than the 0.10 standard deviation for the 1991 Senate Plan. A lower standard deviation score is better.

62. In my expert opinion, the 2011 House of Delegates Plan falls within the discretionary range endorsed by the Virginia State Supreme Court in the *Jamerson* decision.

63. I have also compared the Reock and Polsby-Popper scores for the 2011 House of Delegates map to the same scores for the lower chambers of 8 additional Southern states following their 2010 Decennial Census redistricting. These states are Alabama, Florida, Georgia, Louisiana, Maryland, Mississippi, North Carolina and South Carolina. These scores are found on the top section of Table 4. The same scores for the same states following the 2000 Decennial Census are found on the bottom section of Table 4.

64. Once again, in my expert opinion, Virginia's House of Delegates' Reock and Polsby-Popper scores compare closely with the other 8 states, which all contain numerous minority districts in their maps.

65. Plaintiffs also contend that lack of compactness is somehow indicative of impermissible attention to race when the 2011 House of Delegates Plan was drafted. Districts 74 and 95 are cited as examples of lack of compactness. There are, however four additional districts, with high percentages of non-Hispanic Whites which are similar in terms of compactness scores. These are Districts 13, 17, 22 and 48. They are arguably as lacking in compactness as Districts 74 and 95. The Reock and Polsby-Popper scores for these 6 districts are found on Table 14 and have similar combinations of both scores for both tests.

66. Maps 7 through 11 provide the outlines of the six districts found on Table 14. District 95, located in Hampton City and Newport New City, is on Map 7. District 74, located in Charles City County, Henrico

County and Richmond City is found on Map 8. District 48, located in Arlington and Fairfax Counties, and is found on Map 9. District 13, located in Prince William County and Manassas Park City, and is found on Map 10. Finally, Districts 17 (Botetourt, Roanoke County and Roanoke City) and 22 (Franklin, Campbell and Bedford Counties plus Lynchburg City), are found on Map 11.

PROBABLE REASONS FOR THE SHAPE OF DISTRICTS 74 AND 95

67. Once again, I should make it clear that I did not play any part in the drafting of the 2011 House of Delegates Plan HB 5055. But having 40 years of redistricting plan drafting experience places me in a unique position to ascertain possible motivation for the way individual districts have been crafted. I gave both District 74 and 95 a closer examination to understand why these two districts are configured as drawn.

68. First is the issue of total district population. Table 11 lists all 12 African-American Districts. The column on the right of Table 11 compares the 2010 Decennial population of each district, as it existed prior to the 2011 redistricting, to the ideal district populations for House districts being drafted in 2011. All but one of the 12 African-American districts were significantly under-populated in terms of the 2010 Decennial Census population numbers. Only district 74 was over-populated (by 0.18%) but just slightly. The cumulative under-population of the 12 districts was 98.95%. What this means is that because of the shifts in relative population across Virginia, the 12 African-American districts only contained enough population to draw 11 districts.

69. These districts were also clustered together so that needed areas of population had to be drawn in from neighboring districts, which could not also be African-American districts. Districts 92 and 95, in Hampton and Newport News were adjacent. Districts 77, 80, 89 and 90, in the Norfolk area were adjacent. Finally, the remaining 6 districts (63, 69, 70, 71, 74 and 75) were all adjacent in the greater Richmond Area. Those who have actually drafted redistricting plans in a legislative setting understand that these population issues cannot be solved in a vacuum. In other words, a legislative plan, particularly for a lower chamber, is a highly complex puzzle. Although every legislator would like to believe that the entire map should originate from his or her own district, many policy issues must be resolved to draft a map which can be enacted.

70. Another paramount issue is "core retention". Almost every legislator wants to keep the majority of his, or her, old district in his, or her, new, district. There is also the issue of incumbent residences. Table 11 contains two district core retention factors. Column 2 shows the portion of the population of the old district which was retained in the new district. Column 3 shows the portion of the new district population which is from the old district. As is demonstrated from Table 11, the core retention rate for the 12 African-American districts was very high; even with the need to add significant new population to the 2011 districts.

71. Table 12 lists all 100 of the districts in the 2011 House of Delegates Plan HB 5005. Column 2 show the percentage of the new district population which was in the old district. One should note that three new House districts (2, 10 and 87) do not contain any of the

population of the old districts with the same number. They should be considered to have been collapsed and moved elsewhere in the State. This table does not consider those members whose residences are no longer in their new districts. A number of incumbents found their residences were now located in a new district with another incumbent's residence. The choice, of course, is either to move, run against the other incumbent, seek another political office, or retire. It should be noted that not one of the African-American incumbents was paired with another legislator and the core retention percentages for the African-American districts are higher than for the districts of the entire plan. This is another factor which influenced the shape and locations of these minority districts.

72. The new District 74 is located in almost the same place as the 1991 and 2001 District 74 (See Map 20 for a side-by-side version of all three districts). See Maps 4 and 13 for the location of the old and new District 74 and Map 19 for the location of 1991 District 74. All three versions of House District 74 (1991, 2001 and 2011) included Charles City County and extended in a long narrow configuration along the northeastern border of Henrico County. District 74 could have been withdrawn from Charles City County, but that would have produced a population ripple which could have disrupted the cores of the neighboring African-American districts. It is also important to note that the 2001 version of House District 74 extended into Hopewell City across the James River which, in my expert opinion, makes the 2011 version of District 74 superior in compactness to the 2001 version of that district. In 1991 the House of Delegates drew the districts, and they certainly did not subsequently object to District 74's configuration then. The

district configuration was not a nefarious scheme to violate civil rights. It was essentially pure redistricting politics, favoring the core retention of the districts of African-American incumbents.

73. The area between the York and James Rivers is commonly referred to as "The Peninsula". There are 6 districts located in the area bounded by western and northern boundary of James City County, the York River, the James River and Chesapeake Bay (Districts 91 to 96). On the 2001 map (See Map 18), old District 64 also crossed the James River into the Peninsula. When the 2011 Plan was drafted (See Map 17), there was not enough population for the new House District 64 to cross over the James River, but 6 new districts could be constructed within the portion of the Peninsula from James City southeast to the end of the Peninsula. That was exactly what the plan drafters did. It was a very logical solution. I have included Map 14, which is the old District 95. Old District 95 was the most underpopulated African-American district at -15.16%, was next to old District 92, which was 11.24% underpopulated.

74. The plan drafters, decided to convert District 93 into a GOP district and use the strong Democrat areas of the old District 93 to bring the population of new Districts 92 and 95 up within 1% of the ideal district population. The new District 93 was shifted north into the area which had been located in the old District 64. This left new Districts 91, 94 and 96 as GOP districts.

CONTIGUITY OF HB 5005

75. I have examined the 2011 House of Delegates Plan with respect to the requirement of contiguity and find no issues in this plan. No districts cross the wide tidal estuaries of the James, York and Rappahannock

Rivers and the only crossing of the Chesapeake Bay is from Northampton County to Norfolk City, which is required to give District 100 enough population (34,484) to bring it up to the ideal district population.

CONCLUSIONS

76. This map and the individual majority minority districts contained therein are at least as compact and contiguous as the 1991 and 2001 maps and individual majority minority districts which were approved under the Virginia constitutional standards in *Jamerson* and *Wilkins*.

77. This map is consistent with lower chamber maps in similarly situated states.

78. The high degree of individual district core retention in the 2011 House map was a major factor in the construction of the map. This is particularly the case with regard to the majority minority districts.

79. There was a high degree of protection extended to incumbents, particular in the case of minority incumbents and Republican incumbents.

80. There were no negative contiguity issues in HB 5005.

I declare under penalty of perjury that the foregoing is true and correct.

Executed this 10th day of April, 2015

/s/ Thomas Brooks Hofeller
Thomas Brooks Hofeller, Ph.D.

Exhibit 1

RESUME

Thomas Brooks Hofeller, Ph.D.

6701 Pointe Vista Circle, Raleigh,
North Carolina 27615
Home: (984) 202-5193 – Cell: (703) 623-0764

Qualifications:

A varied career in government, business, academia and politics. Positions of significant responsibility, requiring intelligence, scholarship, communications skills, creativity and leadership include:

- Senior executive management of an office within a large government agency, planning and directing operations of a staff with a diverse number of missions while coordinating activities ranging across an entire agency.
- Successful completion of a Doctorate in Government requiring research and writing skills and the ability to communicate in an academic setting. Also includes a firm grounding in the philosophical and political roots of the American Governmental System.
- Litigation support and courtroom experience as a qualified expert witness in federal court. Clear presentation of difficult demographic and statistical concepts – making them understandable to non-technical audiences.
- Setting up a new U. S. House subcommittee and conducting oversight, developing legislation and interacting with leadership. Experience in statistical, demographic and budgetary analysis.

- Experience in management and information systems – including database construction, geographic information systems and creation of user interfaces that allow access by persons without extensive computer skills.
- Creating and managing small businesses, including budgeting, human resources, facilities management, accounting and shareholder interface.
- Strategic and tactical analysis of political and demographic data for campaigns and political organizations. Understanding of survey design and interpretation, political resource targeting, list development and use of direct mail.

Areas of Expertise:

- Operations: Recruiting, training and directing staffs for existing and newly instituted projects in government and national political organizations. Private sector experience as a business owner and CAO. Proven ability to organize and direct multiple projects with effective use of delegation. Able to function as a team player in both management and support positions.
- Communications: Ability to develop and deliver engaging and informative presentations involving difficult concepts and issues to decision-makers, the public and press. Effective in preparation of affidavits and exhibits as well as giving depositions and delivering courtroom testimony.
- Information Technology: Expertise in analysis of complex technical problems involving large

amounts of data – both for analysis and practical use in business, government and politics. Able to break down information and develop effective solutions. Ability to interface between highly technical personnel and management.

- Considerable experience in integration of mapping and data (geographic information systems).
- Budget & Programs: Experience in budget formulation and managing accurate accounting systems in the private and public sectors.

Education:

- Claremont Graduate University, Claremont, CA – Ph.D. in Government - 1980
- Claremont McKenna College, Claremont CA – B. A. in Political Science - 1970
- U. S. Navy, Electronics School, Treasure Island, CA, Graduate -1966

Publications:

- Thomas S. Engeman, Edward J. Erler and Thomas B. Hofeller (1980. The Federalist Concordance. Chicago: University of Chicago Press.
- Grofman, Bernard and Hofeller, Thomas B (1990). "Comparing the Compactness of California Congressional districts Under Three Different Plans". In Bernard Grofman (ed) *Political Gerrymandering and the Courts.* New York: Agathon.
- Richard Niemi, Bernard Grofman, Thomas Hofeller, and Carl Carlucci (1990). Measuring

the Compactness and the Role of a Compactness Standard in a Test for Partisan Gerrymanderings". *Journal of Politics.*

- Reports and affidavits prepared for, and testimony in, numerous court cases (listed below).

References:

Current and recent employer references are available and will be furnished upon request.

Experience:

Geographic Strategies LLC
7119 Marine Drive Alexandria, Virginia 22307
Partner
May 2011 – Present

- Geographic Strategies provides redistricting services clients including database construction, strategic political and legal planning in preparation for actual line drawing, support services and training on the use of geographic information systems (GIS) used in redistricting, analysis of plan drafts, and actual line-drawing when requested. The corporation and its principals also provide litigation support.

State Government Leadership Foundation
1800 Diagonal Road, Suite 230
Alexandria, VA 22314
Redistricting Consultant
April 2011 – April 2012
Contracting Officer: J. Christopher Jankowski
Executive Director
(571-480-4861

- Retained as a consultant to state legislatures and statewide elected officials in all aspects of their work on the 2011-2012 redistricting process.

Areas of consultation:

- Develop strategic and tactical plans for Legislatures and statewide elected officials to develop and defend redistricting plans for legislative and congressional districts.
- Providing assistance in actual redistricting plan drafting and analysis.
- Providing a linkage between complex legal standards and their practical application to plan drafting in difficult political and technical environments.
- Provide assistance in redistricting litigation
- Identification of specialized GIS software, database and hardware systems to be used by stakeholders.
- Ongoing strategic, technical and legal support to those involved in redistricting in all states.
- Development of a clearinghouse of redistricting activities throughout the nation and analysis of the effects of the process on future elections.

REBUPLICAN NATIONAL COMMITTEE
310 First Street, S.E.
Washington, DC 20003
Redistricting Consultant
May 2009 – April 2011
Contracting Officer: John Phillippe
RNC Chief Counsel
(202) 863-8638

- Retained as a consultant to recreate a new department to coordinate the redistricting activities of the National Committee and the greater GOP community in preparation and execution of the 2011 redistricting Areas of responsibility and to support the Committee's 2011 through 2012 redistricting efforts:
  - Developed a strategic plan for the Committee to best position itself for maximum success in this highly competitive process.
  - Liaison and training with members of Congress, legislators, key statewide officials, state parties and other divisions within the Committee to ensure a high level of political, technical and legal preparation.
  - Recruitment and training of a technical and legal staff.
  - Providing a linkage between complex legal standards and their practical application to plan drafting in difficult political and technical environments
  - Identification of specialized GIS software, database and hardware systems to be used by the Committee and other stakeholders.
  - Ongoing strategic, technical and legal support to members of congress and those involved

in redistricting in all states, including plan drafting.

- Development of a clearinghouse of redistricting activities throughout the nation and analysis of the effects of the process on future elections.

DEPARTMENT OF AGRICULTURE FARM SERVICE AGENCY
1400 Independence Avenue
Washington, DC 20250
Associate Administrator for Operations and Management
June 2004 – January 2009
Supervisor: Teresa C Lasseter, Administrator
Farm Service Agency
(229) 890-9127

- Associate Administrator providing management and oversight to staff with diverse missions supporting the activities of the entire Farm Service Agency (FSA).

Areas of responsibility:

- Provides oversight and guidance to the 1,100 person staff of the Deputy Administrator for Management. These functions include management services, human resources, financial management, budgeting, and information technology.
- Directs the activities of the Office of Civil Rights which performs all of the EEO functions for the Agency, as well managing FSA's diversity programs.
- Provides oversight and guidance to the Office of Business and Program Integration. This office supports a wide range of cross-cutting activities

including economic policy analysis, strategic planning, outreach, state and county office review, county service center integration, emergency planning, county office reviews and audits, e-Government, and program appeals and litigation.

- Has primary oversight of the business realignment process underway in the Agency. This realignment includes such projects as Agency-wide enterprise architecture development, field office realignment, and concurrent changes to the Agency's business processes. This realignment is necessary to allow the Agency to meet the present and future challenges involved in providing the best possible customers service and implementation the President's Management Agenda.
- Spearheads the ongoing reform of the FSA county committee election system which included the drafting of guidelines just published in the Federal Register.

DEPARTMENT OF AGRICULTURE FARM SERVICE AGENCY
1400 Independence Avenue
Washington, DC 20250
Director, Office of Business and Program Integration
Apr. 2003 – June 2004
Supervisor: Verle Lanier, Associate Administrator for Operations and Management (retired)
(301) 424-5776

- Director of a senior level office directing the activities of subordinate staffs with diverse missions supporting the overall activities of the Farm Service Agency.

Areas of responsibility:

- Provided oversight and guidance to the 75-person staff of the Office of Business and Program Integration. This office supported a wide range of cross-cutting activities including economic policy analysis, strategic planning, outreach, state and county office review, county service center integration, emergency planning, county office reviews and audits, e-Government, and program appeals and litigation.
- Directed the development of administrative strategies essential to the successful management of e-Government initiatives. Coordinated citizen-centered eGovernment initiatives.
- Provided centralized direction for the Agency's strategic plan in compliance with the Government Performance and Results Act of 1993.
- Coordinated outreach efforts for all FSA programs to enhance participation of small or limited resource farmers and ranchers to provide equal access to programs striving to acquire and maintain economic viability for family farmers and ranchers.
- Directed the preparation of policies and dockets on national program determinations to be submitted for CCC Board consideration and Federal Register publications.

REPUBLICAN NATIONAL COMMITTEE
310 First Street, S.E.
Washington, DC 20003
Redistricting Director
Jul. '99 – Mar. 2003
Supervisor: Thomas Josefiak, former RNC Chief Counsel
(703) 647-2940

- Hired to create a new department to coordinate the redistricting activities of the National Committee mandated by the release of data from the 2000 Decennial Census.

(See the description of present position.)

U.S. HOUSE SUBCOMMITTEE ON THE CENSUS
Staff Director
Feb. '98 – Jul. '99
Supervisor: Hon. Dan Miller, Chairman
(202) 225-5015

- Staff Director at inception of this oversight subcommittee, created by the House in February of 1998, to monitor the preparations for and the execution of the 2000 Decennial Census. Directed all day-to day operations of the subcommittee including:
  - Recruitment and training of a staff for a new subcommittee.
  - Liaison with the Director and Senior Staff of the Census Bureau, the Department of Commerce, and U.S. Senate Staff involved in census oversight.
  - A complete examination of the preparations underway at the Census Bureau for conduct of the 2000 Decennial Census.

- An examination of the proposed statistical methods proposed by the Bureau to improve coverage of the Census.
- Reviewed and made recommendations to the Chairman and House Leadership regarding census policy.
- Coordination with Government Accounting Office personnel involved in census oversight.
- Preparation and support for oversight hearings conducted by the members of the Subcommittee.
- Interface between the academic statistical community and the subcommittee in the development of census policy.
- Liaison with census stakeholders in general, with particular attention to members of the Decennial Census Advisory Committees.

U.S. HOUSE COMMITTEE ON HOUSE OVERSIGHT
Professional Staff
Nov. '97 – Feb. '98
Supervisor: Hon. William M. Thomas, Chairman
(202) 225-2915

- Involved in the oversight activities of the Committee that supervises the operations of the U.S. House of Representatives. Advised the Chairman and House Leadership on congressional policy with regard to all census operations prior to the establishment of the Subcommittee on the Census.

PARTES CORPORATION
Kirkland, Washington
Director of Administration
Mar. '96 – Nov. '97
Supervisor: Mark Schnitzer, Chairman

- Chief Administrator of a software development company specializing in the creation of databases used by investment professionals to analyze information on securities.

  Information was downloaded, parsed, and reformatted from the Securities and Exchange Commission's EDGAR database and other relevant sources. Was responsible for all administrative functions of the corporation including:

  - Procurement, renovation and management of facilities housing the company.
  - All human resource activities.
  - Accounting and payroll.
  - Liaison with attorneys and shareholders.

CAMPAIGN MAIL & DATA, INC
Falls Church, Virginia
Professional Staff
Nov. '93 – Mar. '96
Supervisor: John Simms, President
(703) 790-8676

- Supervised development and maintenance of geographic databases that were integrated with the company's various political and commercial lists. Created a new department that collected and converted voter lists from states, counties and towns.

NATIONAL REPUBLICAN CONGRESSIONAL COMMITTEE
320 First Street, S.E.
Washington, DC 20003
Redistricting Director
Mar. '89 – Nov. '93
Supervisor: Maria Cino, Chief of Staff

- Created a new department to coordinate the redistricting activities of the NRCC and provide support to all GOP members of the U.S. House and their staffs.

Areas of responsibility:

- Recruitment and training of a technical staff.
- Development of specialized GIS software, databases and hardware systems to be used by the Committee and members of Congress.

REPUBLICAN NATIONAL COMMITTEE
310 First Street, S.E.
Washington, DC 20003
MIS Director
Jan. '82 – Mar. 89

- Transformed the Committee's computer capabilities from a single mainframe system operated completely within a computer division into a building-wide network, utilized by all divisions and from remote locations. Supervised all the Committee's data processing activities, including database and software development. Directed research activities involving analyses of demographic and election data. Primary computer consultant to the GOP's state and county party organizations.

ROSE INSTITURE OF STATE AND LOCAL GOVERNMENT
Claremont McKenna College
Claremont, California
Associate Director
1973 – 1981

- Co-Founder of this Southern California research center specializing in the examination of current financial and political issues affecting California's state and local governments. Supervised staff and day-to-day operations, directed software and database development, managed research projects and assisted in fundraising.

COMPASS SYSTEMS, INC.
AND LOCAL GOVERNMENT
San Diego, California
Vice President
1970 – 1973

- Part of the management team that developed the first computerized geographic mapping and data retrieval system used by the California State Assembly for redistricting and demographic analysis. Directly supervised programming and database development staffs.

UNITED STATES NAVY
Petty Officer 2nd Class
1965 – 1969

- Electronics Technician. Served on USS Porterfield, DD682, in Tonkin Gulf operations during Vietnam War. (Honorable Discharge)

Summary of Participation in Lawsuits:

Shaw v. Hunt, 92-202-CIV-5-BR, U.S. District Court for the Eastern District of North Carolina, Raleigh Division (1993-4)

This case was the second trial phase following the U.S. Supreme Court's reversal of the lower court in *Shaw v. Reno* (1993). Prepared alternative plans for presentation to the court. Prepared political and demographic analyses of the state's plans, along with numerous exhibits supporting the plaintiffs' complaints. Gave a deposition and served as plaintiffs' primary expert witness at trial.

Arizonans for Fair Representation v. Symington, CIV 92-0256, U.S. District Court Arizona (1992), aff'd mem. sub nom. *Arizona Community Forum v. Symington*, 506 U.S. 969 (1992)

Prepared an affidavit evaluating the three major plans submitted to court for redistricting of Arizona's six congressional districts. Plans were examined with regard to all major redistricting criteria. Also examined minority voting strength in proposed new sixth district in State Senate Plan. Gave expert testimony in trial phase. Drafted a new map for presentation in court that was adopted, with minor changes, by the three-judge panel.

De Grandy v. Wetherell, No 92-40015-WS, U.S. District Court Florida (1992)

Prepared model plans and submitted affidavits evaluating alternative plans for two of the parties in the congressional phase of the case and gave testimony on the political and voting rights implications of various other plans. Presented an affidavit and gave expert testimony in the legislative phase of the case for the De Grandy plaintiffs.

Good v. Van Straten, 800 F. Supp. 557, U.S. District Court Eastern & Western Michigan (1992)

Prepared compactness analysis of plans submitted to court to redistrict Michigan's congressional districts. Gave testimony on compactness theories and other relevant redistricting criteria.

Pope v. Blue, U.S. District Court Western District of North Carolina (1992)

Prepared an affidavit containing compactness analysis and political analysis of the plan passed by North Carolina Legislature and approved by U.S. Department of Justice.

Ketchum v. Byrne, 740 F,2d 1398, cert. denied *City Council of Chicago v. Ketchum*, 471 U.S. 1135 (1985), on remand, *Ketchum v. City of Chicago* 630 F. Supp. 551 (N.D. III. 1985)

Consultant to African-American plaintiffs (P.A.C.I.). Assisted in building Plaintiffs' political and demographic database, performed a racial and ethnic analysis of City of Chicago, gave a deposition, and testified in court. Participated in second remedy phase of case, gave a second deposition, was prepared to give testimony (the case was settled before retrial).

Carrillo v. City of Los Angeles, No. CV-85-7739 JMI-JRX (unreported) (C.D. Cal. 1986)

Consultant to Mexican American Legal Defense Fund (MALDEF). Constructed database, performed analysis of ethnic voter registration levels, analyzed various plans submitted by all parties, submitted affidavit to the court.

McNeil v. Springfield School District, 656 F. Supp. 1200, 66 F. Supp. 1208 (C.D. Ill 1987), 851 F.2d, 937 (7th Cir. 1988)

Consultant to counsel for Springfield School Board. Constructed demographic database, performed analyses on various proposed districts, gave deposition, presented affidavit to court. Prepared an analysis determining levels of African-American voting strength in proposed districts.

State of Mississippi v. United States, 490 F. Supp. 569 (D.C.D.C. 1979)

Principle consultant to Joint Reapportionment Committee of Mississippi State Legislature. Compiled data-bases, drew plans, prepared analysis for the legislature, and gave general redistricting advice to Committee Chairman and Counsel. Gave an extensive deposition and testified before the District Court in DC. Assisted in the preparation of all briefs.

Badham v. Eu, 568 F. Supp. 156; 721 F.2d 1170 (1983); – F.Supp. – (Apr. 21 1988), appeal docketed, No. 87-1818 56 U.S.L.W. 3791 (U.S. May 4 1988)

Principle technical consultant to counsel for Badham Plaintiffs and Republican National Committee. In charge of all database construction, development of sample court plans, analyses of Burton Plans and preparation of maps, charts and other materials for trial. Submitted affidavits.

Bandemer v. Davis, 478 U.S. 109 (1986)

Consultant to counsel for amicus, Republican National Committee. Prepared a demonstration plan for brief submitted to U.S. Supreme Court.

California Legislature v. Reinecke, 6 Cal. 3d595 99 Cal. Rptr. 481, 492 P.2d 385 (1972)

As consultant, drafted redistricting plan for California State Senate and Assembly that were subsequently accepted by California Redistricting Commission.

Jordan v. Winter, 541 F. Supp. 1135 (N.D. Miss. 1982)

Performed analyses and gave court testimony on behalf of the defendants.

Gingles v. Edmisten, 590 F. Supp. 345 (N.D.N.C. 1984), aff'd in part and rev'd in part *Thornburg v. Gingles* 478 U.S. 30 (1986)

Consultant to Attorney General. Performed demographic analysis of state with regard to creation of African-American districts for North Carolina General Assembly. Gave deposition and testified in court on behalf of Legislature.

City of Port Arthur v. United States, 459 U.S. 159 (1982)

Consultant to City Attorney. Performed analysis of racial content of City Council Districts. This was required for the case required because the 1980 Decennial Census data were not yet available. Analysis required extensive residential survey to determine racial characteristics of individual districts. Gave a deposition in the case.

Ryan v. Otto, 661 F.2d 1130 (7th Cir. 1981)

Consultant to Republican plaintiffs and Illinois Congressional Delegation. Drew alternative plans for presentation to Court, gave deposition and testimony.

Rybicki v. State Board of Elections, 584 F. Supp. 849 (N.D. Ill. 1984)

Principle technical consultant to State House of Representatives and the Senate Minority Caucus.

Supervised construction of all political and demographic databases. Responsible for design and programming of House's computerized redistricting information system. Analyzed and drafted numerous redistricting plans. Gave depositions and testified at trial.

La Comb v. Growe, 541 F. Supp. 145 (D.Minn.), aff'd sub nom. *Orwall v. La Comb*, 456 U.S. 966 (1982)

Consultant to Minority members of Congressional Delegation. Drafted a plan for presentation to Court and submitted an affidavit.

Karcher v. Daggett, 462 U.S. 725 (1983), 467 U.S. 1222 (1984)

Participated in presentation of briefs on Republican side. Consultant to members of New Jersey Congressional Delegation.

Flanagan v. Gillmor, 561 F. Supp. 36 (S.D.Ohio 1982) *Brown v. Brandon*, (unreported), (S.D.Ohio Jan. 30, 1984), as modified (Feb. 13, 1984), aff'd 467 U.S. 1223 (1985)

Consultant to State Legislature. Modified 1981congressional district redistricting plan to conform to "one person, one vote" standard imposed by decision of the Court.

Massachusetts Republican State Committee v. Connolly, 679 F. Supp. 109 (D. Mass. 1988)

Consultant to counsel for plaintiffs. Examined evidence submitted in regard to 1985 Massachusetts State Census (particularly for Boston), analyzed legislative redistricting plan, submitted affidavit, gave deposition.

Sinkfield v. Bennett, Civil Action CV 93-689-PR (Circuit Court of Montgomery County, Alabama)

Gave testimony supporting the replacement of the Alabama congressional plan drawn by the Federal Court with a plan drawn by the Circuit Court.

Mississippi State Conference of the NAACP v. Haley Barbour, Civil Action No. 3:11-ev-159 TSL-EGJ-LG (SD Mississippi, Jackson Division – 2011)

Prepared a declaration for the intervenors analyzing the compactness and deviations of various legislative plans submitted to the Court for consideration.

Dickson v. Rucho, Civil Action 11 CVS 16896 and *North Carolina State Conference of the NAACP v. State of North Carolina*, Civil Action 11CVS 16940 (General Court of Justice, Superior Court Division, Raleigh, North Carolina – 2011)

Submitted two affidavits and gave a deposition concerning my role as a consultant to the General Assembly with regard to the redistricting of North Carolina State Senate and State House of Representative districts as well as the redistricting of that state's congressional districts. Testified at hearing before 3-judge panel.

Boone v. Nassau County Legislature, Civil Action CV 11-cv 02712 (Supreme Court of the State of New York, County of Nassau - 2011)

Prepared an affidavit evaluating the 2011 redistricting plan enacted by the Nassau County Legislature and other sample plans presented by the Plaintiffs, with particular attention to the efficacy of the use of the U.S. Census Bureau's American Community Survey for measuring compliance with the provisions of Section 2 of the Federal Voting Rights Act.

Petteway v. Henry, Civil Action CV 11-411 (SD Texas, Galveston Div. 2011)

Prepared and presented at trial an alternative redistricting plan Galveston County's commissioner districts to the court for defendant intervenors.

Pearson v. Koster, Civil Action 11AC-CC00624 (Circuit Court of Cole County, Missouri, Div. I - 2012)

Prepared an affidavit evaluating the compactness of Missouri's newly enacted congressional districts (2011) in light of the State Supreme Court's remand of this case for determination of whether or not, in light of Plaintiffs' alleged claims to the contrary, the districts reflected in H.B. 193 were sufficiently compact to meet the requirement contained in the Missouri Constitution that districts be "composed of territory as compact as may be." Served as the expert witness at trial for the defendant intervenors.

Bob Johnson v. State of Missouri, Civil Action 12AC-00056 (Circuit Court of Cole County, Missouri 2012)

Prepared an affidavit analyzing the compactness and deviations of the enacted State House of Representative districts.

Harris v. Arizona Independent Redistricting Commission, Civil Action cv-12-0894-PHX-ROS (United States District Court, District of Arizona 2012)

Prepared affidavits analyzing the state legislative districts enacted by the Arizona Independent Redistricting Commission concerning population deviations, ethnic and racial characteristics and adherence to other neutral redistricting criteria. Presented expert testimony at trial.

Cynthia Hauser v. Martin O'Malley, Civil Action September Term 2012, Misc. No 5 – 2012, (Maryland Court of Appeals)

Prepared a declaration analyzing the State Senate and State House of Maryland enacted by the Governor following the 2010 Census and comparing both plans to senate and house plans submitted by plaintiffs.. Conclusions were made concerning the integrity of county lines, and district deviations as well as adherence to the provisions of the federal Voting Rights Act.

Kermit L. Moore, Jr. v. State of Tennessee, In the Chancery Court Case No. 120402-III (2012)

Prepared an affidavit analyzing the State Senate redistricting plan enacted by the Legislature for the 2012 elections and compared it to a plan submitted as a bill by the opposition. Conclusions were made analyzing the compliance of both plans with the federal and state provisions of one-person/one vote.

David Harris v. Patrick McCrory, Civil Action No. 1:13 CV-00949 (United States District Court, Middle District of North Carolina Durham Division 2013)

Retained by Defendant's counsel to prepare a declaration in response to plaintiffs' expert report' concerning the congressional redistricting plan enacted by the North Carolina General Assembly in 2011. Gave a deposition concerning the construction and characteristics of the congressional district contained in the enacted plan as well as other relevant congressional maps.

Terry Petteway v. Galveston County, Texas, Civil No. 3:-cv-00308, United States District Court, Southern district of Texas, Galveston Division 2013)

Retained by Defendant's counsel to prepare a redistricting map for Galveston County's Justice of the

Peace Precincts, prepared a declaration in response to plaintiffs' experts' reports and gave testimony at trial.

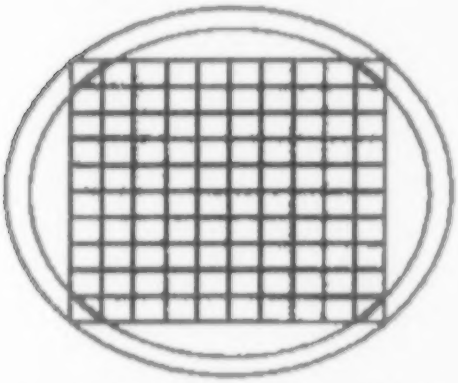
North Carolina State Conference of the NAACP v. Patrick Lloyd McCrory, 1:13 CV-658 (United States District Court, Middle District of North Carolina 2013)

Retained by Defendant's counsel to prepare an expert report summarizing a study of information from the voter files of North Carolina's State Board of elections as compared to the North Carolina Department of Motor Vehicles' (DMV) customer file as well as locations of DMV offices proximity to potential registered votesr who do not appear to have drivers licenses or DMV ID,s Performed and analyses of demographics and registration information with regard to this information. Analyzed the locations and hours of one-stop voting centers.

FIGURE 1

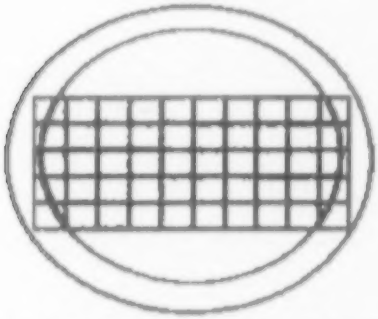
HYPOTHETICAL LEGISLATIVE DISTRICTS A, B & C

Showing Reock and Polsby Circles



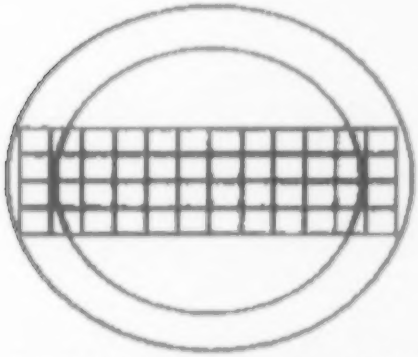
DISTRICT A

Reock Circle is Red. Reock Score is 0.6367
Polsby-Popper Circle is Blue. Polsby-Popper Score is 0.7853



DISTRICT B

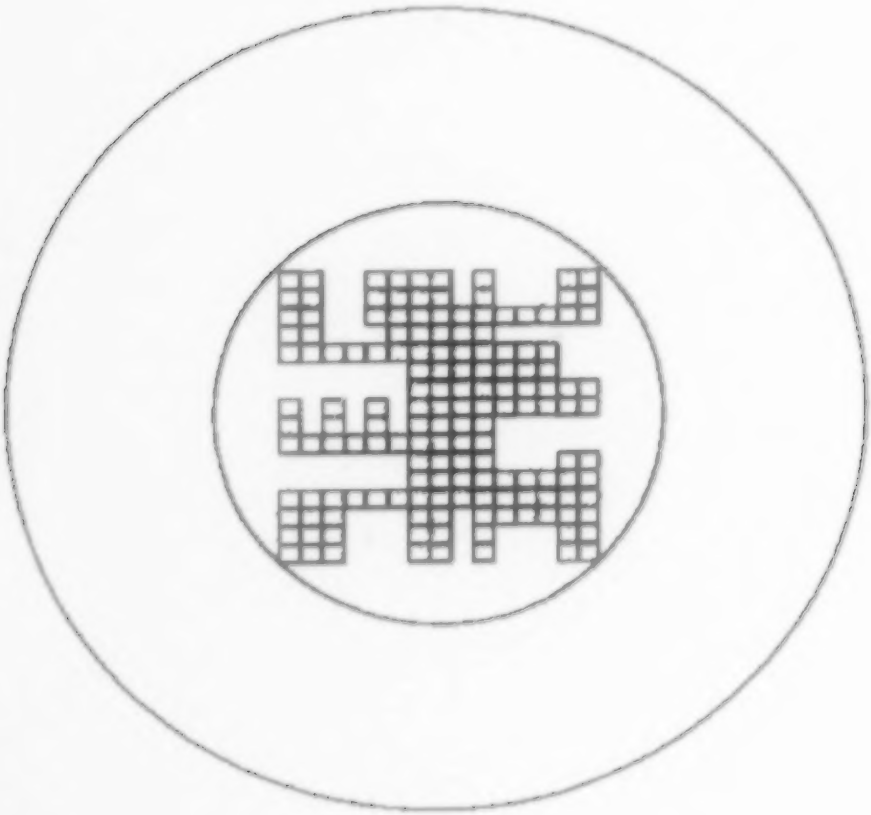
Reock Circle is Red. Reock Score is 0.509
Polsby-Popper Circle is Blue. Polsby-Popper Score is 0.698



DISTRICT C

Reock Circle is Red. Reock Score is 0.380
Polsby-Popper Circle is Blue. Polsby-Popper Score is 0.589

FIGURE 2
HYPOTHETICAL LEGISLATIVE DISTRICT D
Showing Reock and Polsby Circles



Reock Circle is Red. Reock Score is .405

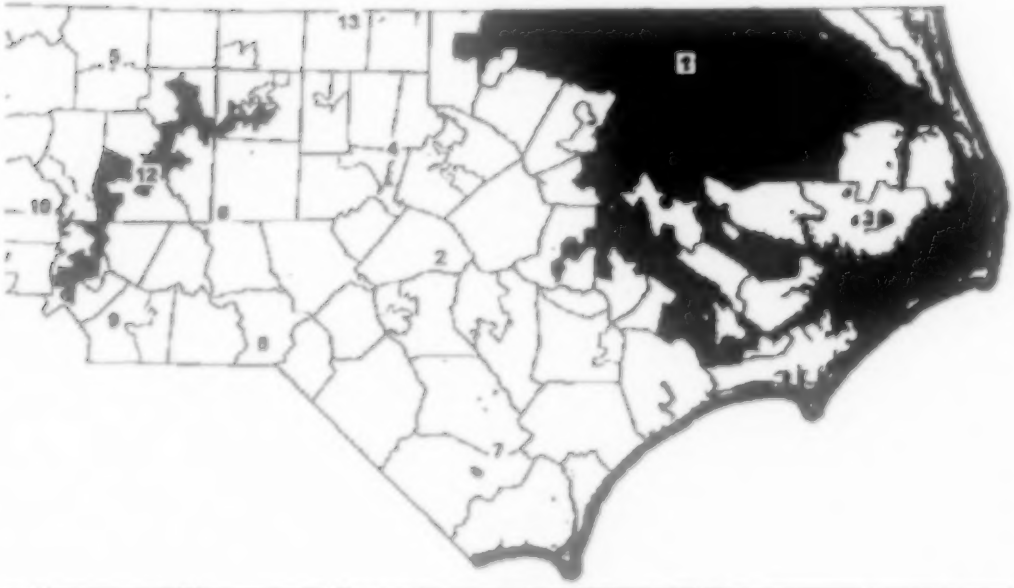
Polsby-Popper Circle is Blue Polsby-Popper Score is .082

Map 1

North Carolina Congressional Districts 1992

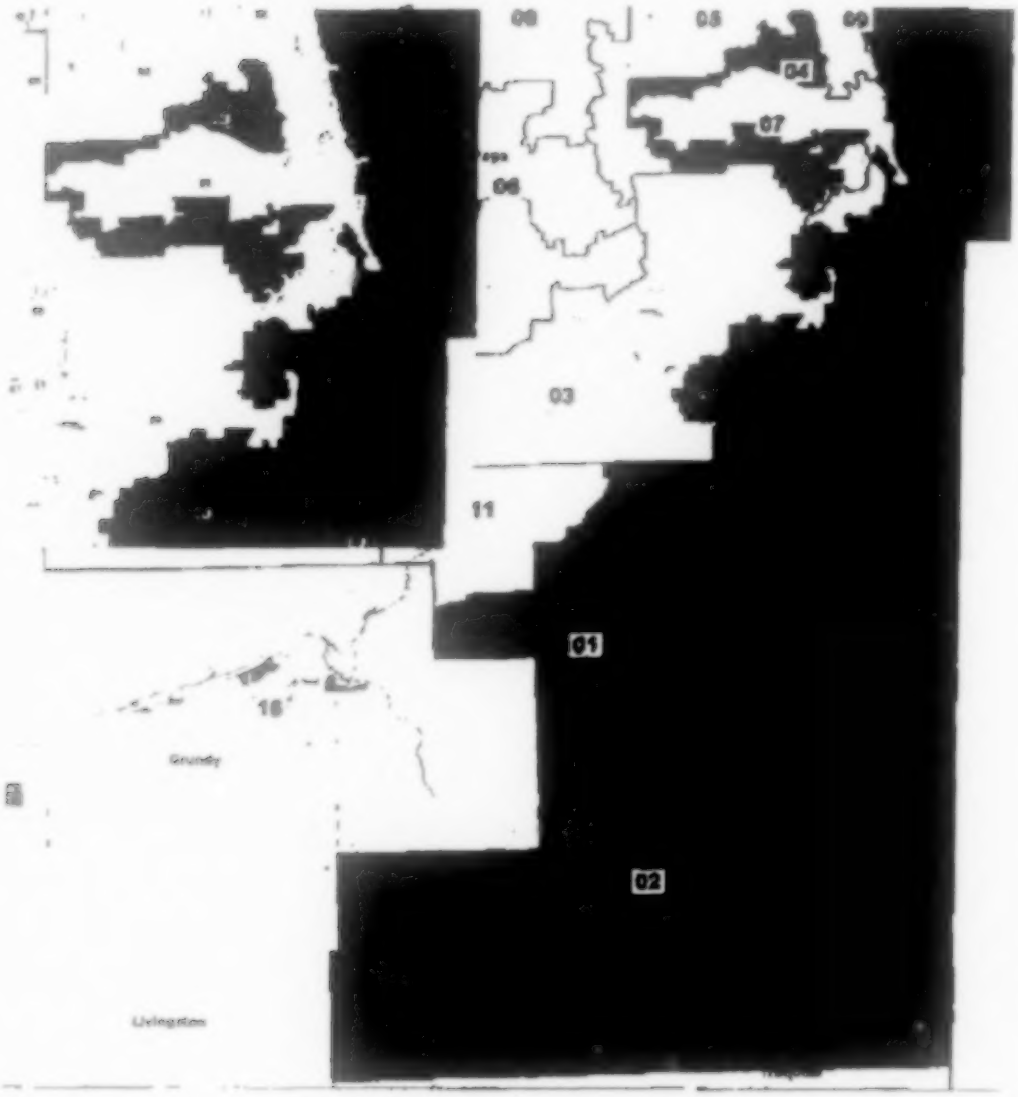
MAP 2

North Carolina Congressional Districts 2001



Map 3

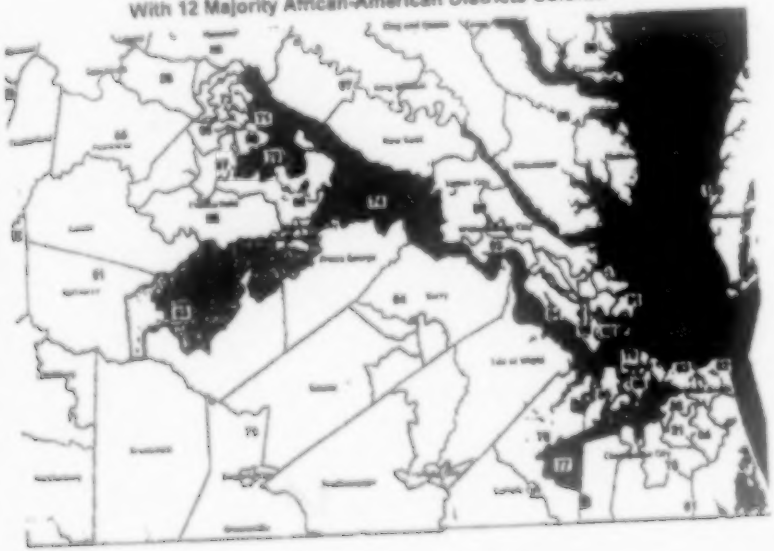
Illinois Congressional Districts 2011



MAP 4

HB 5005 Virginia House Districts (2011)

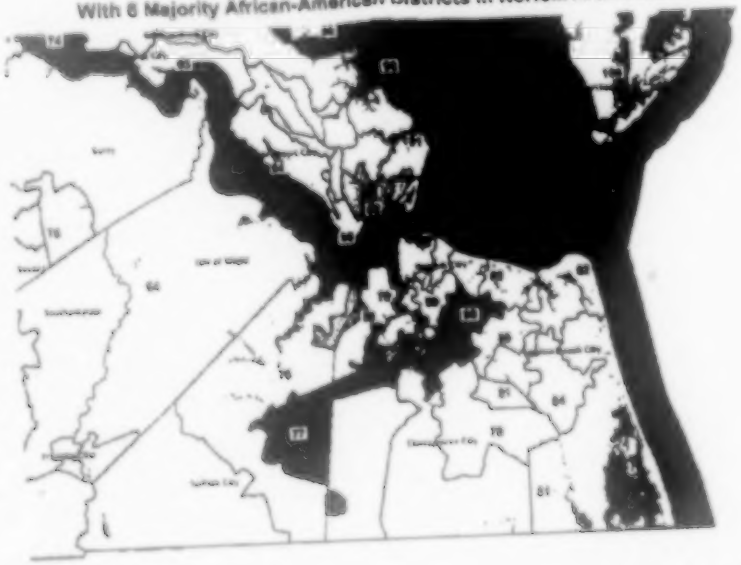
With 12 Majority African-American Districts Colored



MAP 5

HB 5005 Virginia House Districts (2011)

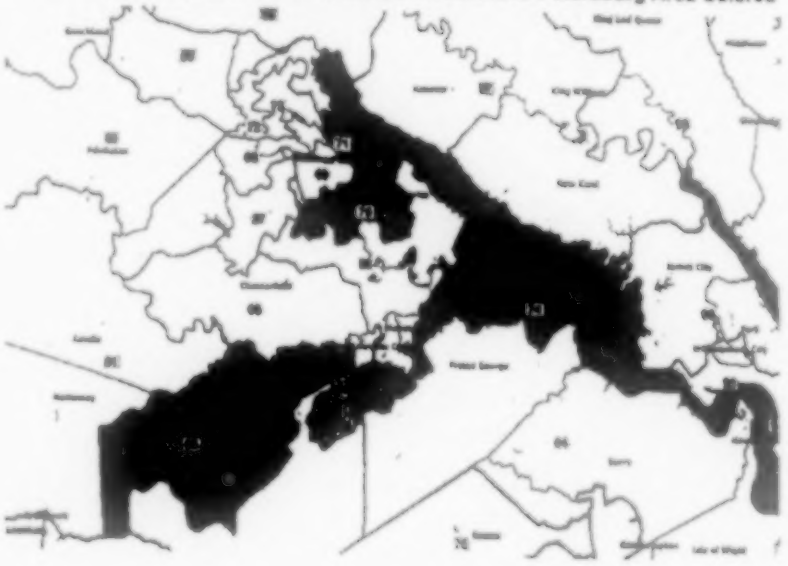
With 6 Majority African-American Districts in Norfolk Area Colored



MAP 6

HB 5005 Virginia House Districts (2011)

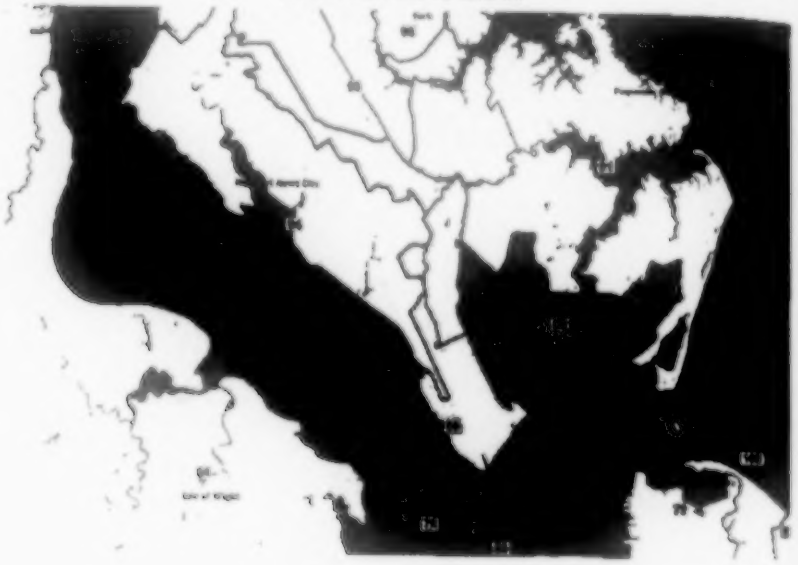
With 5 Majority African-American Districts in Richmond-Petersburg Area Colored



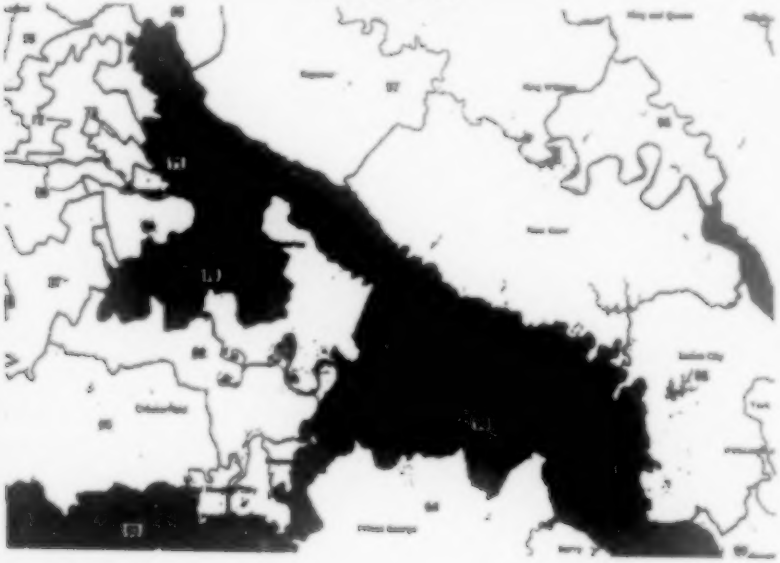
MAP 7

HB 5005 Virginia House Districts (2011)

House Districts 92 and 95

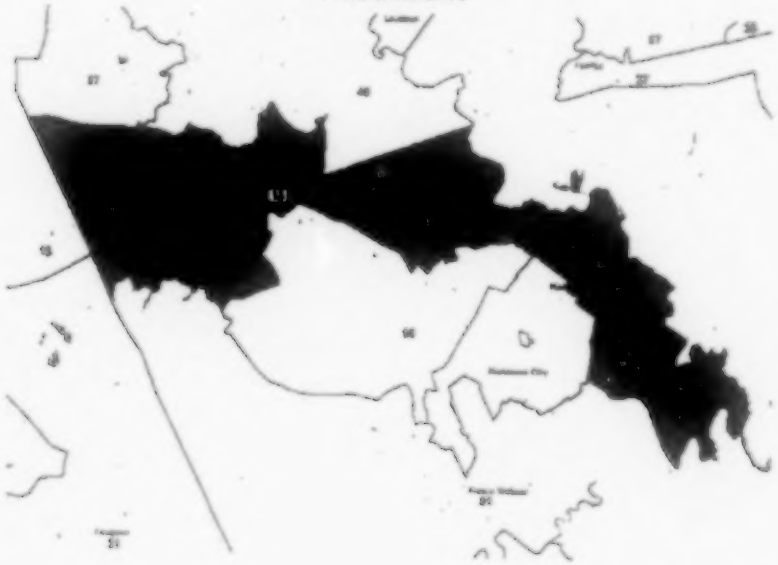


MAP 8
HB 5005 Virginia House Districts (2011)
House District 74



MAP 9
HB 5005 Virginia House Districts (2011)
House District 48

MAP 10
HB 5005 Virginia House Districts (2011)
House District 13

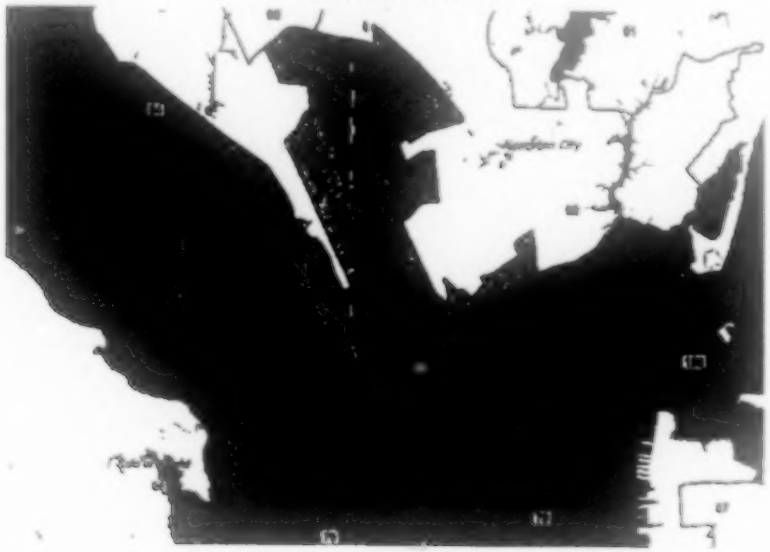


MAP 11
HB 5005 Virginia House Districts (2011)
House Districts 17 & 22

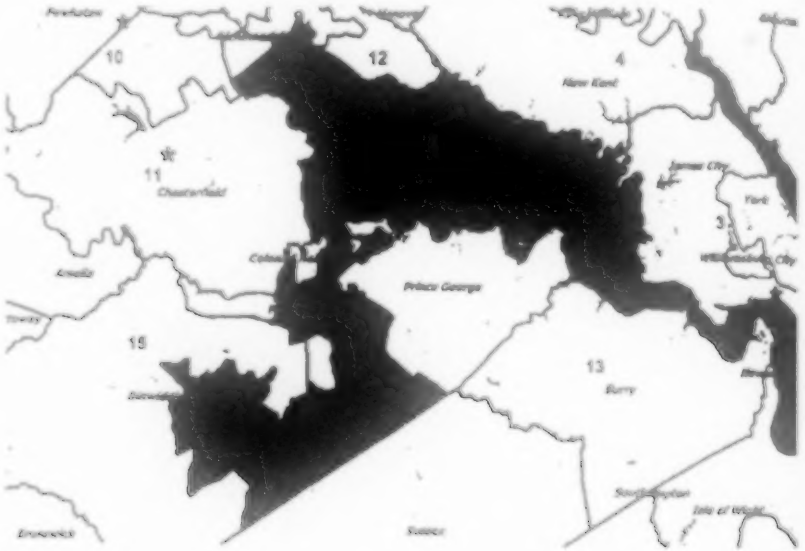
MAP 12
1991 State Senate Districts
Senate Districts 15 & 18

MAP 13
2001 State House Districts
House District 74

MAP 14
2001 State House Districts
House District 95

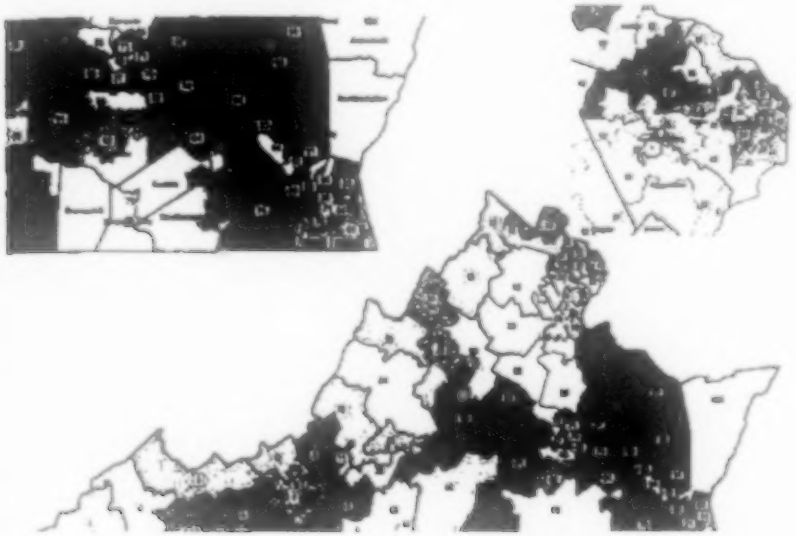


MAP 15
1991 SENATE DISTRICT 16



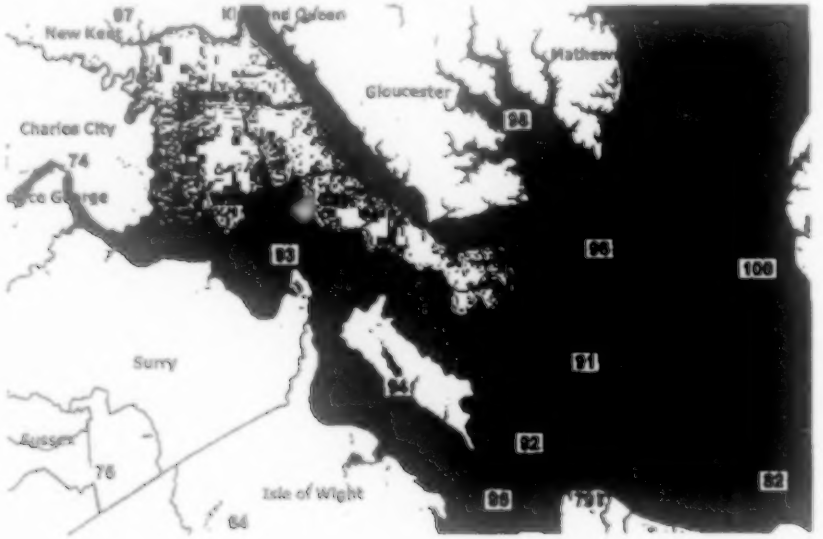
MAP 16

2011 Virginia House Districts - HB 5005



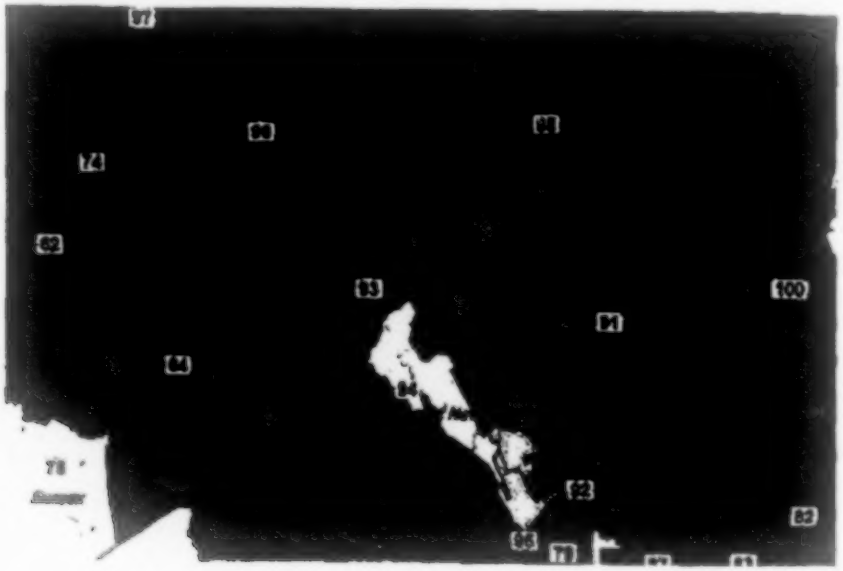
MAP 17

2011 HOUSE DISTRICTS - THE PENINSULA



MAP 18

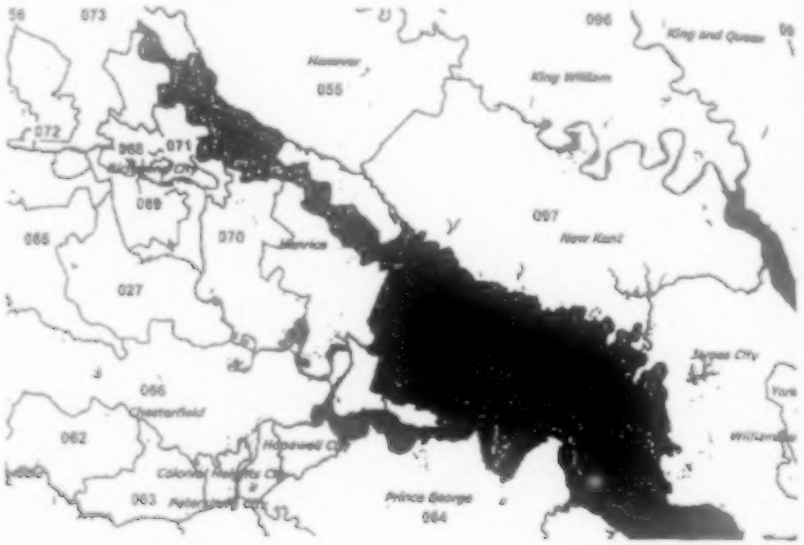
2001 HOUSE DISTRICTS ON "THE PENISULA"



DEFENDANT-INTERVENORS TX 814 - Page 058

MAP 19

1991 House of Delegates District 74

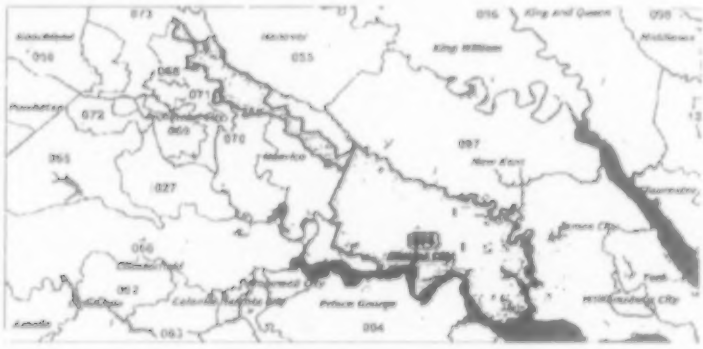


DEFENDANT-INTERVENORS TX 814 - Page 059

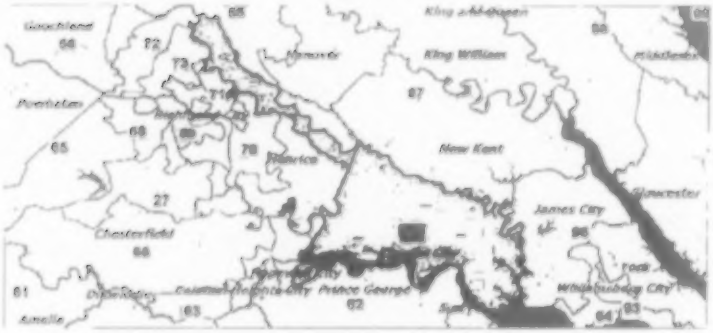
MAP 20

Comparison of House District 74 in 1991, 2001 & 2011

1991



2001

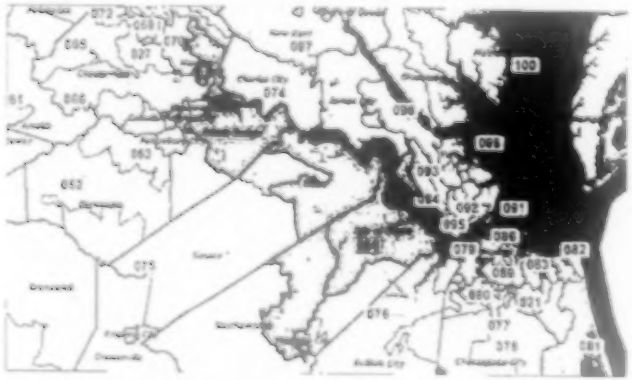


2011

MAP 21

Examples of Non-Compact Districts in 1991 House Plan

District 64



District 77

District 89

District 98

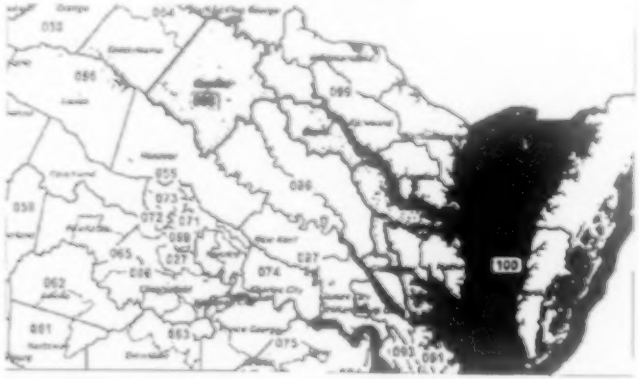


TABLE 1

1991 NORTH CAROLINA CONGRESSIONAL PLAN

Reock & Polsby-Popper Compactness Scores

District Number	Reock Score	Polsby-Popper Score
1	0.26	0.02
2	0.25	0.05
3	0.37	0.05
4	0.41	0.31
5	0.14	0.07
6	0.45	0.08
7	0.32	0.05
8	0.34	0.14
9	0.28	0.06
10	0.30	0.05
11	0.29	0.12
12	0.05	0.01

Min	0.05	0.01
Max	0.45	0.31
Mean	0.29	0.09
Std. Dev.	0.11	0.08

Scorces: North Carolina General Assembly Legislative Services for shape file United States Bureau of the Census TIGER Line File

TABLE 2

2011 ILLINOIS CONGRESSIONAL PLAN

Reock & Polsby-Popper Compactness Scores

District Number	Reock Score	Polsby-Popper Score
01	0.19	0.12
02	0.32	0.36
03	0.28	0.17
04	0.30	0.05
05	0.31	0.09
06	0.31	0.11
07	0.25	0.08
08	0.40	0.12
09	0.24	0.13
10	0.35	0.18
11	0.36	0.12
12	0.31	0.24
13	0.29	0.19
14	0.32	0.17
15	0.32	0.21
16	0.35	0.23
17	0.31	0.19
18	0.49	0.23

Min	0.19	0.05
Max	0.56	0.62
Mean	0.33	0.19
Std. Dev.	0.08	0.13

Source: United States Bureau of the Census TIGER Line File

TABLE 3

VIRGINIA HOUSE AND SENATE COMPACTNESS 1991, 2001 AND 2011

Showing Reock and Polsby-Popper Scores

State	Reock				Polsby-Popper			
	Minimum	Maximum	Mean	Std. Dev.	Minimum	Maximum	Mean	Std. Dev
1991 House	0.14	0.61	0.37	0.11	0.07	0.60	0.25	0.10
2001 House	0.16	0.61	0.38	0.10	0.10	0.58	0.26	0.10
2011 House	0.14	0.62	0.36	0.11	0.08	0.55	0.24	0.09
1991 Senate	0.12	0.63	0.36	0.11	0.09	0.43	0.24	0.10
2001 Senate	0.14	0.54	0.36	0.10	0.13	0.41	0.24	0.08
2011 Senate	0.14	0.46	0.27	0.08	0.08	0.39	0.16	0.06

Source: United States Census Bureau 2010 Redistricting Data TIGER File.

TABLE 4

MULTIPLE STATE LOWER HOUSE PLAN FOR SOUTHERN STATES

Reock and Polsby Popper Compactness Scores Before and After 2010 Census

District Enacted After the 2010 Decennial Census

State	Reock				Polsby-Popper			
	Minimum	Maximum	Mean	Std. Dev.	Minimum	Maximum	Mean	Std. Dev.
Louisiana	0.11	0.65	0.38	0.11	0.05	0.51	0.26	0.10
Mississippi	0.16	0.61	0.38	0.10	0.07	0.66	0.26	0.12
Alabama	0.11	0.64	0.37	0.10	0.06	0.49	0.21	0.10
Georgia	0.13	0.63	0.39	0.11	0.09	0.54	0.28	0.09
Florida	0.08	0.65	0.43	0.11	0.08	0.68	0.43	0.13
South Carolina	0.11	0.61	0.39	0.09	0.11	0.54	0.28	0.09
North Carolina	0.12	0.57	0.38	0.10	0.04	0.57	0.24	0.11
Maryland	0.16	0.59	0.36	0.10	0.01	0.42	0.18	0.11
Virginia	0.14	0.62	0.36	0.11	0.08	0.55	0.24	0.09

District Enacted Prior to the 2010 Decennial Census

State	Reock				Polsby-Popper			
	Minimum	Maximum	Mean	Std. Dev	Minimum	Maximum	Mean	Std. Dev
Louisiana	0.13	0.62	0.37	0.11	0.06	0.54	0.26	0.10
Mississippi	0.10	0.61	0.34	0.11	0.04	0.59	0.19	0.11
Alabama	0.13	0.61	0.39	0.10	0.07	0.74	0.25	0.12
Georgia	0.19	0.65	0.41	0.11	0.07	0.62	0.29	0.10
Florida	0.14	0.58	0.35	0.11	0.09	0.50	0.24	0.10
South Carolina	0.14	0.61	0.40	0.10	0.13	0.67	0.30	0.10
North Carolina	0.15	0.64	0.41	0.10	0.06	0.64	0.31	0.11
Maryland	0.16	0.59	0.37	0.10	0.01	0.55	0.22	0.13
Virginia	0.16	0.61	0.38	0.10	0.10	0.58	0.26	0.10

Source: U. S. Census Bureau 2010 TIGER line files

TABLE 5

1991 STATE HOUSE PLAN

Reock & Polsby-Popper Compactness Scores

District Number	Reock Score	Polsby-Popper Score
041	0.38	0.34
042	0.38	0.24
043	0.29	0.34
044	0.61	0.41
045	0.31	0.28
046	0.50	0.53
047	0.22	0.24
048	0.26	0.21
049	0.37	0.28
050	0.24	0.15
051	0.36	0.33
052	0.34	0.32
053	0.30	0.23
054	0.39	0.30
055	0.35	0.23
056	0.46	0.35
057	0.48	0.32
058	0.42	0.24
059	0.52	0.29
060	0.61	0.35
061	0.42	0.21
062	0.32	0.07
063	0.46	0.23
064	0.26	0.10

065	0.32	0.25
066	0.22	0.16
067	0.45	0.33
068	0.38	0.26
069	0.29	0.17
070	0.39	0.13
071	0.36	0.19
072	0.34	0.19
073	0.35	0.12
074	0.14	0.11
075	0.39	0.17
076	0.43	0.14
077	0.16	0.08
078	0.46	0.37
079	0.48	0.33
080	0.48	0.34
081	0.49	0.49
082	0.57	0.42
083	0.25	0.19
084	0.37	0.35
085	0.54	0.30
086	0.23	0.36
087	0.32	0.29
088	0.41	0.19
089	0.20	0.09
090	0.25	0.13
091	0.42	0.24
092	0.38	0.20
093	0.17	0.16
094	0.32	0.33

095	0.30	0.30
096	0.19	0.13
097	0.23	0.14
098	0.15	0.09
099	0.24	0.31
100	0.39	0.38

Min	0.14	0.07
Max	0.61	0.60
Mean	0.37	0.25
Std. Dev.	0.11	0.10

Source: U. S. Census Bureau 2010 TIGER line file

TABLE 6

1991 STATE SENATE PLAN

Reock & Polsby-Popper Compactness Scores

District Number	Reock Score	Polsby-Popper Score
1	0.51	0.22
2	0.21	0.10
3	0.28	0.21
4	0.39	0.29
5	0.30	0.18
6	0.39	0.28
7	0.32	0.21
8	0.35	0.33
9	0.26	0.13
10	0.29	0.19
11	0.38	0.30
12	0.18	0.13
13	0.24	0.18
14	0.49	0.35
15	0.23	0.10
16	0.33	0.09
17	0.38	0.30
18	0.12	0.10
19	0.37	0.43
20	0.46	0.42
21	0.63	0.38
22	0.26	0.17
23	0.47	0.33
24	0.39	0.27

25	0.35	0.29
26	0.27	0.17
27	0.38	0.24
28	0.14	0.13
29	0.34	0.35
30	0.34	0.16
31	0.43	0.31
32	0.48	0.30
33	0.51	0.40
34	0.28	0.20
35	0.49	0.21
36	0.49	0.30
37	0.36	0.18
38	0.38	0.18
39	0.24	0.15
40	0.20	0.17

Min	0.12	0.09
Max	0.63	0.43
Mean	0.35	0.24
Std. Dev.	0.11	0.09

Source: U. S. Census Bureau 2010 TIGER line file

TABLE 7

2001 HOUSE OF DELEGATES PLAN
Reock & Polsby-Popper Compactness Scores

District Number	Reock Score	Polsby-Popper Score
1	0.18	0.22
2	0.36	0.23
3	0.38	0.19
4	0.40	0.29
5	0.43	0.23
6	0.38	0.21
7	0.32	0.16
8	0.52	0.43
9	0.32	0.20
10	0.33	0.20
11	0.49	0.26
12	0.23	0.22
13	0.36	0.15
14	0.18	0.18
15	0.44	0.22
16	0.33	0.12
17	0.23	0.11
18	0.47	0.27
19	0.54	0.22
20	0.47	0.18
21	0.21	0.18
22	0.39	0.20
23	0.38	0.20
24	0.57	0.19
25	0.45	0.24

26	0.52	0.54
27	0.30	0.23
28	0.48	0.28
29	0.45	0.30
30	0.59	0.32
31	0.34	0.14
32	0.35	0.35
33	0.42	0.31
34	0.30	0.25
35	0.38	0.28
36	0.47	0.34
37	0.50	0.35
38	0.52	0.33
39	0.29	0.26
40	0.39	0.29
41	0.44	0.25
42	0.39	0.24
43	0.49	0.58
44	0.36	0.26
45	0.33	0.17
46	0.51	0.40
47	0.34	0.33
48	0.26	0.20
49	0.25	0.19
50	0.47	0.26
51	0.40	0.28
52	0.47	0.33
53	0.44	0.24
54	0.37	0.33
55	0.39	0.25

56	0.41	0.32
57	0.30	0.18
58	0.34	0.15
59	0.59	0.26
60	0.34	0.28
61	0.36	0.15
62	0.34	0.14
63	0.61	0.48
64	0.42	0.19
65	0.48	0.34
66	0.31	0.24
67	0.44	0.26
68	0.35	0.19
69	0.37	0.20
70	0.47	0.14
71	0.24	0.19
72	0.25	0.22
73	0.37	0.18
74	0.16	0.10
75	0.42	0.22
76	0.39	0.18
77	0.18	0.17
78	0.54	0.46
79	0.35	0.22
80	0.39	0.26
81	0.40	0.28
82	0.56	0.57
83	0.31	0.38
84	0.35	0.31
85	0.53	0.43

86	0.34	0.28
87	0.38	0.24
88	0.35	0.16
89	0.58	0.31
90	0.35	0.24
91	0.57	0.40
92	0.28	0.15
93	0.17	0.19
94	0.35	0.40
95	0.43	0.28
96	0.23	0.15
97	0.27	0.11
98	0.25	0.26
99	0.27	0.21
100	0.27	0.35

Min	0.16	0.10
Max	0.61	0.58
Mean	0.38	0.26
Std. Dev.	0.10	0.10

Source: U. S. Census Bureau 2010 TIGER line file

TABLE 8

2001 STATE SENATE PLAN

Reock & Polsby-Popper Compactness Scores

District Number	Reock Score	Polsby-Popper Score
1	0.41	0.23
2	0.46	0.30
3	0.28	0.17
4	0.31	0.24
5	0.35	0.15
6	0.31	0.31
7	0.29	0.20
8	0.29	0.41
9	0.24	0.14
10	0.54	0.31
11	0.48	0.38
12	0.43	0.34
13	0.42	0.20
14	0.44	0.32
15	0.39	0.19
16	0.36	0.16
17	0.49	0.34
18	0.22	0.13
19	0.41	0.25
20	0.32	0.23
21	0.32	0.18
22	0.24	0.13
23	0.53	0.25
24	0.42	0.23

25	0.23	0.14
26	0.43	0.27
27	0.33	0.19
28	0.16	0.18
29	0.31	0.26
30	0.29	0.19
31	0.51	0.34
32	0.38	0.29
33	0.47	0.39
34	0.46	0.29
35	0.49	0.25
36	0.32	0.20
37	0.26	0.24
38	0.21	0.14
39	0.30	0.20
40	0.14	0.16

Min	0.14	0.13
Max	0.54	0.41
Mean	0.36	0.24
Std. Dev.	0.10	0.08

Source: U. S Census Bureau 2010 TIGER line file

TABLE 9

2011 HOUSE OF DELEGATES PLAN
Reock & Polsby-Popper Compactness Scores

District Number	Reock Score	Polsby-Popper Score
1	0.26	0.30
2	0.30	0.18
3	0.28	0.21
4	0.49	0.20
5	0.19	0.17
6	0.27	0.26
7	0.50	0.25
8	0.47	0.26
9	0.35	0.24
10	0.23	0.18
11	0.59	0.26
12	0.39	0.22
13	0.16	0.13
14	0.24	0.16
15	0.55	0.34
16	0.36	0.18
17	0.25	0.09
18	0.62	0.24
19	0.43	0.17
20	0.27	0.15
21	0.42	0.31
22	0.20	0.11
23	0.26	0.15
24	0.44	0.25
25	0.26	0.18

26	0.46	0.36
27	0.35	0.25
28	0.39	0.26
29	0.36	0.21
30	0.53	0.36
31	0.38	0.19
32	0.46	0.31
33	0.33	0.23
34	0.24	0.22
35	0.20	0.19
36	0.43	0.30
37	0.18	0.18
38	0.62	0.45
39	0.35	0.19
40	0.26	0.17
41	0.36	0.32
42	0.35	0.20
43	0.22	0.21
44	0.43	0.32
45	0.29	0.26
46	0.52	0.55
47	0.41	0.33
48	0.18	0.16
49	0.24	0.16
50	0.46	0.34
51	0.24	0.18
52	0.23	0.25
53	0.46	0.34
54	0.47	0.25
55	0.57	0.28
56	0.34	0.22

57	0.45	0.41
58	0.32	0.19
59	0.30	0.21
60	0.38	0.31
61	0.32	0.17
62	0.36	0.13
63	0.25	0.16
64	0.37	0.16
65	0.37	0.27
66	0.31	0.27
67	0.32	0.25
68	0.36	0.25
69	0.52	0.34
70	0.40	0.19
71	0.33	0.24
72	0.26	0.08
73	0.39	0.15
74	0.16	0.12
75	0.41	0.19
76	0.48	0.17
77	0.19	0.15
78	0.46	0.35
79	0.45	0.26
80	0.26	0.11
81	0.40	0.23
82	0.57	0.45
83	0.52	0.34
84	0.44	0.26
85	0.40	0.24
86	0.35	0.25
87	0.22	0.17

88	0.28	0.13
89	0.40	0.20
90	0.46	0.20
91	0.60	0.47
92	0.34	0.26
93	0.22	0.16
94	0.35	0.38
95	0.14	0.14
96	0.20	0.17
97	0.43	0.21
98	0.28	0.26
99	0.27	0.21
100	0.28	0.37

Min	0.14	0.08
Max	0.62	0.55
Mean	0.36	0.24
Std. Dev.	0.11	0.09

TABLE 10

2011 STATE SENATE PLAN

Reock & Polsby-Popper Compactness Scores

District Number	Reock Score	Polsby-Popper Score
1	0.16	0.16
2	0.23	0.15
3	0.29	0.11
4	0.33	0.18
5	0.36	0.17
6	0.30	0.30
7	0.32	0.24
8	0.30	0.39
9	0.19	0.11
10	0.30	0.13
11	0.36	0.20
12	0.46	0.23
13	0.31	0.17
14	0.24	0.13
15	0.22	0.13
16	0.31	0.10
17	0.38	0.17
18	0.27	0.14
19	0.30	0.13
20	0.20	0.12
21	0.21	0.14
22	0.35	0.18
23	0.34	0.20
24	0.23	0.15

25	0.30	0.15
26	0.43	0.28
27	0.25	0.20
28	0.15	0.08
29	0.16	0.10
30	0.21	0.10
31	0.17	0.16
32	0.25	0.17
33	0.26	0.15
34	0.31	0.16
35	0.42	0.24
36	0.21	0.09
37	0.18	0.10
38	0.21	0.15
39	0.32	0.20
40	0.14	0.15

Min	0.14	0.08
Max	0.46	0.39
Mean	0.27	0.17
Std. Dev.	0.08	0.06

Source: U. S. Census Bureau 2010 TIGER line file

TABLE 11

COMPARISON OF CORE CONSTITUENCIES

Comparing Baseline Districts to Enacted Districts
2011 House of Delegates Plan

District	Part of Old District in New	Part of New District from Old	2010 Population Deviation
63	86.59	80.20	-7.86
69	83.17	74.70	-10.89
70	67.31	67.31	-0.79
71	84.78	78.31	-7.27
74	79.52	80.08	0.18
75	88.50	78.64	-11.94
77	77.02	74.40	-3.85
80	68.53	59.94	-11.78
89	82.40	76.86	-7.19
90	71.52	63.21	-11.16
92	86.70	77.27	-11.24
95	73.31	62.15	-15.16
All 12 Dists.	79.11	72.76	-98.95

Source: Maptitude Reports using 2010 Decennial Census Data

TABLE 12

2011 VIRGINIA HOUSE DISTRICTS Core District Retention Percentages

District	Core Retension Percentage	African-American Majority#	A.A. Core Retension Percentage
1	78.79		
2	-		
3	79.81		
4	21.97		
5	36.06		
6	17.05		
7	52.71		
8	71.76		
9	57.90		
10	-		
11	80.68		
12	51.08		
13	55.98		
14	81.49		
15	81.90		
16	71.47		
17	69.06		
18	59.22		
19	69.15		
20	55.03		
21	68.77		
22	50.33		
23	68.04		
24	75.65		

25	60.19		
26	96.34		
27	48.40		
28	84.12		
29	68.93		
30	95.69		
31	68.56		
32	87.65		
33	74.32		
34	53.98		
35	67.55		
36	77.68		
37	53.62		
38	53.01		
39	58.44		
40	80.42		
41	69.82		
42	78.87		
43	74.65		
44	86.34		
45	74.03		
46	87.94		
47	80.88		
48	69.20		
49	50.99		
50	58.40		
51	66.09		
52	34.51		
53	76.07		
54	100.00		

55	63.44		
56	93.97		
57	82.49		
58	83.37		
59	61.35		
60	86.10		
61	81.91		
62	56.65		
63	80.20	1	80.20
64	56.20		
65	78.05		
66	87.43		
67	90.57		
68	65.45		
69	74.70	1	74.70
70	67.31	1	67.31
71	78.31	1	78.31
72	51.53		
73	49.89		
74	80.08	1	80.08
75	78.64	1	78.64
76	93.25		
77	74.40	1	74.40
78	94.48		
79	42.35		
80	59.94	1	59.94
81	67.37		
82	71.08		
83	52.01		

84	75.83		
85	60.22		
86	73.13		
87	-		
88	59.00		
89	76.86	1	76.86
90	63.21	1	63.21
91	61.66		
92	77.27	1	77.27
93	51.43		
94	76.26		
95	62.15	1	62.15
96	65.56		
97	60.95		
98	94.97		
99	100.00		
100	56.91		

Indicated by a "1"

Note: Three Districts should be considered to have collapsed. They are Districts 2, 10 and 87.

Note: Average core retention for the 100 districts is 67.09%. For the 97 districts which were not collapsed average retention is 69.09%. For the 12 African-America majority districts, average core retention is 72.76%.

Source: Maptitude Reports using 2010 Decennial Census Date

TABLE 13

2001 NORTH CAROLINA CONGRESSIONAL PLAN

Reock & Polsby-Popper Compactness Scores

District Number	Reock Score	Polsby-Popper Score
1	0.39	0.08
2	0.30	0.07
3	0.41	0.07
4	0.48	0.23
5	0.40	0.23
6	0.38	0.09
7	0.61	0.20
8	0.34	0.21
9	0.34	0.12
10	0.41	0.18
11	0.34	0.25
12	0.12	0.03
13	0.24	0.08

Min	0.12	0.03
Max	0.61	0.25
Mean	0.37	0.14
Std. Dev.	0.12	0.08

Scorces: North Carolina General Assembly Legislative Services for shape file

United States Census Bureau for TIGER line file

TABLE 14

2011 HOUSE PLAN HB 5005

Comparison of Compactness Scores for 6 Least Compact Districts

District Number	Reock Score	Polsby-Popper Score	% 18+ AP African-American
13	0.16	0.13	13.66
17	0.25	0.09	6.22
22	0.20	0.11	20.75
48	0.18	0.16	4.88
74	0.16	0.12	57.88
95	0.14	0.14	61.16

Score: U.S. Census Bureau TIGER Line File

IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTICT OF VIRGINIA
(RICHMOND DIVISION)

Civil Action No. 3:14-cv-00852-REP-GBL-BMK

GOLDEN BETHUNE-HILL, *et al.*,

Plaintiffs,

v.

VIRGINIA STATE BOARD OF ELECTIONS, *et al.*,

Defendants.

DECLARATION OF M.V. HOOD III

I, M.V. Hood III, do hereby declare the following:

I. INTRODUCTION AND BACKGROUND

My name is M.V. (Trey) Hood III, and I am a tenured professor at the University of Georgia with an appointment in the Department of Political Science. I also serve as the Director of Graduate Studies for the Department. I have been a faculty member at the University of Georgia since August of 1999. I am an expert in American politics, specifically in the areas of electoral politics, racial politics, election administration, and Southern politics. I teach courses on American politics, Southern politics, and research methods and have taught graduate seminars on the topics of election administration and Southern politics.

I have received research grants from the National Science Foundation and the Pew Charitable Trust. I have also published peer-reviewed journal articles

specifically in the areas of election administration and redistricting. My academic publications are detailed in a copy of my vita that is attached to the end of this document. Currently, I serve on the editorial boards for *Social Science Quarterly* and *Election Law Journal*. The latter is a peer-reviewed academic journal focused on the area of election administration.

During the preceding four years, I have offered expert testimony in eight cases, *State of Florida v. United States* (No. 11-1428, D.D.C.), *NAACP v. Walker* (11-CV-5492, Dane County Circuit Court), *Jones v. Deininger* (12-CV-00185-LA), *Frank v. Walker* (2:11-CV-01128-LA), *South Carolina v. United States* (No. 12-203, D.D.C), *Rios-Andino v. Orange County* (6:12-cv-1188-Orl-22KRS), *Veasey v. Perry* (2:13-cv-193, NGR), and *United States v. North Carolina* (1:13-CV-861). In assisting the defendants in analyzing Virginia's current House of Delegates districting plan, I am receiving $300 an hour for this work and $300 an hour for any testimony associated with this work. In reaching my conclusions, I have drawn on my training, experience, and knowledge as a social scientist who has specifically conducted research in the area under examination in this expert report.

II. SCOPE AND OVERVIEW

I have been asked by counsel for the State of Virginia to respond to the expert report of Professor Stephen Ansolabehere and in so doing, to provide my own assessment of Virginia's current districting plan for the House of Delegates. In Section III, I provide some brief background on the districting plan under challenge. Section IV analyzes this plan on a number of traditional redistricting principles; Section V discusses the preclearance process; Section VI examines the legislative districts under challenge; Section VII

performs a legislative roll-call analysis relating to action in the House of Delegates; and Section VIII evaluates the current redistricting plan in light of the 2011 elections. The final section of my report (XI) provides a synopsis of my overall conclusions in this case.

III. BACKGROUND

Following the 2010 Census and prior to the primary election period in 2011, the Virginia General Assembly redrew legislative district boundaries for both the House of Delegates and the Senate. Legislation to accomplish this goal (HB 5005) was signed into law by Governor McDonnell on April 29, 2011.[1] Elections for the House of Delegates were held under this plan for the 2011 and 2013 election-cycles. At issue under the current House of Delegates plan are 12 majority-black districts which are being challenged by the plaintiffs in this case.[2]

IV. PLAN COMPARIONS[3]

A. Population Deviation

The principle goal of any legislative redistricting plan is to ensure that districts have equal population counts. State legislative plans have been given more tolerance on this point compared to congressional

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[1] See http://redistricting.dls.virginia.gov/2010/News.aspx.

[2] These districts are 63, 69, 70, 71, 74, 75, 77, 80, 89, 90, 92, and 95.

[3] Data used for analyses presented in this report were acquired through counsel for the State of Virginia. Redistricting materials can be found at the Virginia Division of Legislative Services (http://redistricting.dls.virginia.gov/2010/Default.aspx) and election data can be found at the Virginia Department of Elections (http://elections.virginia.gov/).

plans (where essentially no deviation is permitted).[4] Nevertheless, it is in the interest of the state to assure political equality among citizens is maintained; and thus, it is paramount to limit population deviations across districts to the extent possible.

In this section I will undertake an examination of population deviations across the 2011 House of Delegates plan. In doing so I will also make some observations about the House of Delegates districts under the previous plan (2009). Following the 2010 Census the total population of Virginia was 8,001,024. With 100 House of Delegate districts this made the ideal district size 80,010. Prior to drawing new districts it is no surprise that many of the existing districts were under-populated or over-populated, sometimes drastically so, in relation to this target number. Looking at Table 1, one can see that prior to redistricting, the smallest district had a population of only 64,074 (.80 the ideal district size), while the largest district had a population of 190,620 (or 2.4 times the ideal district size). Relatively speaking, this would translate to a range of 19.9% below to 138.3% above the ideal district size.

Table 1. Population Deviation-Virginia House of Delegates

	2009 Districts	2011 Districts
Ideal District Size	80,010	80,010
Least Populated	64,074	79,210

[4] See Charles S. Bullock, III. 2010. *Redistricting: The Most Political Activity in America*. New York: Rowman & Littlefield Publishers.

Highest Populated	190,620	80,800
Absolute Range	126,546	1,590
Relative Range-Low	-19.92%	-1.00%
Relative Range-High	+138.25%	+0.99%

Notes: Ideal District Size based on 2010 Census.

Following the redistricting undertaken by HB 5005, population across districts was essentially equalized. The smallest district stood at 79,210 and the largest at 80,800—an absolute range of only 1,590. In relative terms, all 100 House of Delegates districts ranged between 1.0% below to .99% above the ideal district size. A +/-1% tolerance is certainly below the +/- 2% range that characterized the benchmark plan. The 2011 redistricting plan more than meets the first and most overriding goal of any redistricting plan, namely ensuring population equality across election districts.

B. Maintaining Communities of Interest

Another traditional redistricting principle involves an effort, where possible, to respect existing political boundaries such as counties. Virginia also has another designation, independent cities, which are equivalent to counties. For this part of my analysis, I will also treat counties and independent cities as equivalent. The table below (Table 2) compares the previous plan for the House of Delegates (2009) to the currently implemented plan (2011) on this dimension. The percentage of counties and independent cities not split across legislative districts, at 44%, remained constant across the two plans. More than a majority of the counties

and independent cities in Virginia then are wholly preserved within House of Delegate districts in both the 2009 and 2011 plans. The only difference between the two plans does not involve the number of counties/ independent cities which are split geographically, but where such splits do not contain any population. In this case there are three counties/independent cities split but unaffected in the 2009 plan and one present in the 2011 plan. If we include this category with the number of counties/independent cities that are not split, 56.0% are unaffected in 2009 versus 56.0% in 2011. The number of counties and independent cities *unaffected* then remains the same across the redistricting cycle.

While maintaining existing communities of interest is an important principle when drawing legislative district boundaries, this consideration does not override the dictate that population counts across districts should be equal. As the previous section of this report outlines, the 2011 plan accomplishes this criteria, keeping deviations across House districts within the +/-1% range. Given that population equality overrides the goal of maintaining existing communities of interest, it is not always possible to fully accomplish the latter. In this light, the House of Delegates plan for 2011 does a suitable job of balancing this consideration against the chief goal of population equality.

Table 2. Communities of Interest across Legislative Plans

	2009 Plan	2011 Plan
Counties/Independent Cities	44.0%	44.0%
Split	[59]	[59]
Not Split/Unaffected	56.0%	56.0%
	[75]	[75]
Split Counties/	2.2%	0.7%
Independent Cities-Unaffected	[3]	[1]
Total	134	134

C. VTD Splits

Another area I will examine involves the number of voting tabulations districts (VTDs) that were split between legislative districts. I will compare the previous plan (in place for the 2009 elections) to the current plan (in place for the 2011 elections). The results are summarized in Table 3. below.[5] In the previous plan there were 86 VTDs split between legislative districts. Another three VTDs were split, but essentially unaffected in that the split was geographic in nature and did not involve actual population residing within the VTD. All told, 96.4% of the VTDs in the previous plan were not split (or were unaffected in population terms) between legislative districts. Looking at the current

[5] The summary numbers provided in Table 3 related to split VTDs do not match the figures reported by Professor Ansolabehere. He records just over twice the number of split VTDs: 174 under the benchmark plan and 236 under HB 5005 (Ansolabehere Expert Report. March 11, 2015. Paragraph 61).

plan, the number of split VTDs increases slightly to 116 (8 VTDs were split but unaffected in population terms). Of the total, the percentage of VTDs not split or unaffected in the current plan equals 95.1%. In summary, while the percentage of VTDs split across House of Delegate districts does increase with the 2011 plan, the increase equates to a little more than 1%. Looking at things from the opposite direction, the vast majority of VTDs in the previous plan are not split across districts. This observation also applies to the 2011 plan as well.

Table 3. Examination of Net VTD Splits across Legislative Plans

	2009 Plan	2011 Plan
Split VTDs	3.6%	4.9%
	[86]	[116]
Not Split/Unaffected	96.4%	95.1%
	[2,287]	[2,257]
Split VTDs-Unaffected	0.1%	0.3%
	[3]	[8]
Total VTDs	2,373	2,373

D. District Compactness

Another important redistricting principle is that of drawing districts that are compact in nature. I use two commonly accepted measures of compactness, the Perimeter-to-Area measure and Smallest Circle score, to analyze the previous House of Delegates plan in place in 2009 and the current plan enacted for the 2011 elections. Hereafter, I will use the term Reock to

refer to the Smallest Circle score of compactness measure and the Polsby-Popper measure to refer to Perimeter-to-Area measure of compactness. Niemi et al. (1990: 1161) classify the Reock measure as one that compares the area of the district to the area of a circle. More formally the Reock measure is the *ratio of the district area to the area of the minimum circumscribing circle*. The Polsby-Popper measure is a perimeter-area comparison which calculates the *ratio of the district area to the area of a circle with the same perimeter* or formally [(4πArea)/Perimeter^2]. Both the Reock and the Polsby-Popper measures range between 0 and 1, with 1 an indication of perfect compactness. Again, in both cases a district which was a perfect circle would score a value of 1.[6]

Looking at Table 4, the average district compactness changed little across these two districting plans. Overall, the average district was slightly less compact in 2011 as compared to 2009. Using the Reock measure, the mean score for 2009 districts was .38, compared to .36 for the 2011 plan. The mean Polsby-Popper value was .24 in 2009 and .22 in 2011. Both sets of compactness measures also show approximately the same range in values (minimums and maximums) and variation (standard deviation calculations) for the 2009 districts as compared to the 2011

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[6] For more information on these measures see: Polsby, David, and Robert D. Popper, 1991. "The Third Criterion: Compactness as a Procedural Safeguard against Partisan Gerrymandering." *Yale Law and Policy Review*, 9: 301-353; Reock, Jr., Ernest C. 1961. "A Note on Measuring Compactness as a Requirement of Legislative Appointment." *Midwest Journal of Political Science* 5: 70-74; and Niemi, Richard G., Bernard Grofman, Carl Calucci, and Thomas Hofeller. 1990. "Measuring Compactness and the Role of a Compactness Standard in a Test for Partisan and Racial Gerrymandering." *Journal of Politics* 52: 1155-1181.

districts. In summary, using two different commonly accepted measures, it is difficult to discern any appreciable changes in legislative district compactness across the two districting plans.

Table 4. Examination of District Compactness across Legislative Plans

	2009		2011	
	Reock	Polsby-Popper	Reock	Polsby-Popper
Mean	.38	.26	.36	.24
Median	.38	.24	.35	.22
Minimum	.16	.10	.14	.08
Maximum	.61	.58	.62	.55
Standard Deviation	.10	.10	.11	.09

E. Partisanship and Incumbent Pairings

In this section I will examine the district partisanship and incumbent pairings by comparing the previous House of Delegates plan (in place for the 2009 elections) to the current plan (in place for the 2011 elections). Virginia does not have a closed primary system and, as a consequence, does not have political party registration. One can, however, estimate the partisan preferences of a legislative district using election data. In this case, I calculated a Democratic Vote Average (DVA) based on the share of the Democratic vote cast for the three statewide constitutional offices in 2009—governor, lieutenant governor, and attorney

general.[7] The DVA was calculated for the House of Delegate districts as they existed in 2009 and then recalculated using the 2011 district boundaries. These elections are the most proximate to the House of Delegate contests under analysis and are representative of the off-year electorate for state elections in Virginia. Using a vote average also helps to mitigate against election-specific effects that may be tied to a particular candidate or contest.

Table 5. below compares Democratic partisanship across redistricting cycles. As configured in 2009, the districts had an average DVA of 43.9%, compared to 43.6% in 2011. The minimum, maximum, and standard deviations also showed very little variation. Overall then, the mean DVA figure was hardly altered by redistricting. However, when one categorizes these districts by the party holding the seat, an interesting pattern does emerge.[8] First, one may note that the maximum value for the DVA index for GOP-held districts went from 51.4% in 2009 to 49.2% in 2011. Prior to the 2011 elections then no Republican delegate seat contained a majority of Democratic partisans. Second, in reference to Democratic-held seats

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[7] Democratic Vote Average = [(Democratic percentage of the two-party vote for governor + Democratic percentage of the two-party vote for lieutenant governor + Democratic percentage of the two-party vote for attorney general) / 3]. I would also like to note that I disagree with Professor Ansolabehere's choice of elections that he used in his analyses, specifically the 2008 and 2012 presidential contests, the 2012 U.S. Senate race, and the 2013 gubernatorial race (Ansolabehere Expert Report. March 11, 2015. Paragraph 138).

[8] Party of seat in 2009 is defined by the party affiliation of the election winner from that election cycle. In 2011, party is defined by the incumbent (or previous incumbent if open) holding the seat just prior to the 2011 elections.

the DVA has a much greater range, from a low of 31.9% to a high of 79.8%. Almost a third (28.2%) of the seats held by Democrats going into the 2011 elections contained less than a majority of Democratic partisans. While the overall range was diminished by the 2011 plan, it is still almost 50-points (the range for GOP-held seats is only 25.9). Likewise, another measure of dispersion, the standard deviation is 11.8—more than twice that for Republican districts at 5.0. Such is an indication that, across Democratic-held districts, the partisan composition showed much greater variation in comparison to the partisan composition of Republican-held districts.

To summarize, the 2011 redistricting plan for the House of Delegates in Virginia appears to purposefully concentrate Republican voting strength in existing GOP-held districts while at the same time dispersing Democratic partisans. In fact, Democratic voting strength is so depleted in a number of districts as to put the probability of continued Democratic control of these seats in jeopardy. Section VIII of this report specifically examines the effect of this action before and after the 2011 election.

Table 5. Democratic Partisanship Index (DVA) Descriptives

	All Districts	Democratic	Republican	Independent
2009 Districts				
Mean	43.9%	57.2%	35.5%	33.3%
Maximum	76.6%	76.6%	51.4%	40.4%
Minimum	22.5%	25.9%	22.5%	26.3%

Standard Deviation	14.1	12.6	6.2	10.0
2011 Districts				
Mean	43.6%	57.1%	35.0%	34.8%
Maximum	79.8%	79.8%	49.2%	36.5%
Minimum	23.3%	31.9%	23.3%	33.1%
Standard Deviation	13.6	11.8	5.0	2.4

Next, I will examine the 2011 plan in light of incumbent pairings that were created. The 2011 plan as implemented created six districts in which incumbents were paired against one another (see Table 6. below). More specifically, three sets of Democratic incumbents were paired against one another, while only one district featured a set of paired GOP incumbents. Two other districts featured a Democratic incumbent facing a Republican incumbent. All told, few incumbents were placed in jeopardy by the 2011 redistricting plan for the House of Delegates. Half of the incumbent pairings featured a Democratic versus Democrat matchup, additional evidence that the plan was designed, in part, to promote GOP seat gains. In addition, none of the incumbent pairings featured a minority legislator. The six incumbent pairings created six open seats. A closer look at these districts indicates that only one of these open seats had a DVA value greater than 50%.[9] The average DVA value for the five other seats was only 39.8%. The formation of these open seats then created an opportunity for additional Republican seat gains.

[9] District 49 had a DVI value of 68.8%.

Table 6. Incumbent Pairings Created by the 2011 Redistricting Plan

2011 District Number	Partisan Pairing	2009 District Numbers
4	D, D	4, 2
100	D, D	100, 87
45	D, D	45, 49
29	R, R	29, 18
16[10]	D, R	10, 16
94[10]	D, R	93, 94

F. District Core Retention

A secondary goal that often manifests itself in redistricting plans involves maintaining the core population of a district. In other words, some population component from the old district is held over and becomes the core of the new district. This component is closely related to incumbent electoral success and, as such, is a major element of any plan drawn with the idea of protecting incumbents across a redistricting cycle.

The intuition is straightforward. Over time certain advantages accrue to incumbent office holders such as

[10] Delegate Robin Abbott was elected to District 93 in 2009. With the redistricting plan enacted in 2011, she was placed in District 94 with another incumbent, Glenn Oder (who represented the former District 94). Before the 2011 election, Abbott relocated to the new District 93 and ran for re-election. For purposes of any election analysis, therefore, she is coded as a Democratic incumbent representing District 93. Likewise, Ward Armstrong represented District 10 in 2009. Before the 2011 elections he was placed in District 16 with another incumbent, Donald Merricks. Armstrong moved and ran for reelection from the new District 9, facing Republican incumbent Charles Poindexter.

increased familiarity among their constituents. In this sense incumbents are able to cultivate a *personal vote* that typically exceeds what the partisan balance of the district alone would yield in terms of their vote share. When an incumbent's constituents are drawn out of their district they are replaced with a new set of citizens who are unfamiliar with the incumbent. Large shifts of this type can be detrimental to the incumbent's reelection effort. Those voters new to the district (and likewise new to the incumbent) act more like voters in an open seat scenario. These voters may, therefore, fall back on their own partisan proclivities as a voting cue because of a lack of familiarity with the incumbent. Retaining a large population core representative of an incumbent's previous constituency helps to insulate the office holder from political uncertainty that can accompany redistricting.[11]

To the extent that core population segments from previous districts are being carried over to new districts, the probability of reelection for incumbents will be buoyed. In order to explore this factor, I analyze the percentage of the voting age population in a 2011 district (post-redistricting) that was comprised of its former self. More simply, the figure could be thought of as the percentage of an incumbent's old district

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[11] For examples of the linkage between redistricting and electoral effects see M.V. Hood III and Seth C. McKee. "Trying to Thread the Needle: The Effects of Redistricting in a Georgia Congressional District." *PS: Political Science and Politics* 42(4): 679-687; M.V. Hood III and Seth C. McKee. 2012. "Unwelcome Constituents: Redistricting and Countervailing Partisan Tides." *State Politics and Policy Quarterly* 12(2): 203-224 and M.V. Hood III and Seth C. McKee. 2008. "Gerrymandering on Georgia's Mind: The Effects of Redistricting on Vote Choice in the 2006 Midterm Election." *Social Science Quarterly* 89(1); 60-77.

found in the new district. The results are presented in Table 7 below.

The average 2011 House of Delegates district retained 67.2% of its previous constituents. More than two-thirds of the post-redistricting population for a given district then had been part of the old district as configured in 2009. This finding is certainly one hallmark of a redistricting plan designed to protect incumbents. Sub-setting these calculations by the party holding the seat following the 2009 elections, one may note some differences. First, the average GOP-held district retained a higher percentage of former constituents, at 70.4%, as compared to the average Democratic district at 62.4%. An even larger difference can be denoted if we examine seats held by white Democrats where the average drops to 58.0%. While all these groups, on average, maintained more than a majority of their former district population base, the slippage on this metric is most notable when comparing GOP-seats to those held by white Democrats—a 12.4 percentage point difference. To the extent then that a secondary goal of this plan, beyond protecting incumbents of both parties, can be discerned from this examination it would appear to be an effort for the Republican Party to pick up some additional number of seats by depleting districts represented by white Democrats of their former constituents. These GOP efforts did not extend to black legislators who, on average, retained the highest percentage of previous constituents at 71.3%.

Table 7. Legislative District Population Retention, 2011

	All	Republican	Independent	Democratic	White Democrats
Mean	67.2%	70.4%	65.5%	62.4%	58.0%
Median	69.4%	69.5%	65.5%	69.7%	61.9%
Minimum	0.0%	17.3%	61.7%	0.0%	0.0%
Maximum	100.0%	100.0%	69.3%	100.0%	100.0
Standard Deviation	19.7	16.1	5.4	24.0	26.9
Totals	100	59	2	39	26

V. U.S. DEPARTMENT OF JUSTICE PRE-CLEARANCE

When the current districting plan for the Virginia House of Delegates was signed into law on April 29, 2011 Section 5 of the Voting Rights Act was still in place. As such, the State of Virginia submitted this plan to the Department of Justice for preclearance. In a letter dated June 17, 2011 the Attorney General indicated that he was not interposing any objection to the State's legislative districting plans (either the House of Delegates or the Senate).[12] Given the Section 5 standard that the new plan cannot leave minorities worse off than the *status quo*, the failure of the U.S. Department of Justice to object to the legislative redistricting plan should serve as evidence that it judged the 2011 plan would not lead to retrogression.

[12] Source: http://redistricting.dls.virginia.gov/2010/Data/Ref/preclearance _letters.pdf.

The pre-2011 plan for the House of Delegates contained 12 majority-black districts, as did the 2011 plan.[13] The 2011 plan also created an additional multi-racial/ethnic majority district comprised of Hispanic and black voters. As noted above, black legislators, on average, retained an even larger share of their constituents in the new plan than did the Republicans who drew the plan. While Section 5 is currently unenforceable following a U.S. Supreme Court decision, the 2011 redistricting plan for the Virginia House of Delegates should be viewed through this lens as it was fully in effect when the plan was created. Even without Section 5, had Virginia reduced the number of majority-minority districts in the 2011 plan the state would then be open to a possible Section 2 claim.

VI. DISTRICTS UNDER CHALLENGE

The plaintiff's in this case are challenging twelve districts, all of which are majority-black, on the basis that racial composition was the predominant factor in the creation of these districts. In this section I will examine these twelve districts on a number of redistricting metrics. The first table (Table 8) surveys the 12 districts by exploring district population deviations and racial composition for these districts as they existed in 2009 and again, following redistricting, in 2011. The first column of the table lists the population over- or under-count from the 2011 ideal district size of 80,010. The next column translates these raw totals into a percentage measure of deviation.

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[13] Two of these majority-black districts elected white Democrats (Carr-District 69 and Morrissey-District 74). Three black members were elected from districts which were not majority black (Ware-District 11; Herring-District 46; and Torian-District 52).

Ten of the twelve districts were under-populated by far more than -1.0% (the goal of the redistricting plan was to keep all House of Delegate districts within a +/- 1% range). Even if one were to use the +/- 5% tolerance level, nine of the districts would fall below the -5% threshold. Given that most of these districts were under-populated, it was necessary to shift additional population from surrounding areas to bring them up to an acceptable level. The next two columns in the table demonstrate that the redistricting plan accomplished this goal—all twelve districts in 2011 fall within the +/-1% range. In fact, these districts fall within an even tighter band, ranging from -0.9% to +0.9%.

The next columns examine the black voting age population in each district before (2009) and after redistricting (2011). Looking at 2009, the percentage black VAP ranges from a low of 46.3% to a high of 62.7%. One district (71) has slipped below the threshold to be classified as a majority-black district. Comparing the 2009 figures with 2011, one can note that percent black VAP increased in six districts while falling in the remaining six. In 2011, the percent black VAP ranged from a low of 55.2% to a high of 60.7%. In 2011 then the upper-bound was reduced 2.0 percentage points (from 62.7% to 60.7%). Looking at these twelve districts as a group, the mean black VAP value across these two time periods remained essentially unchanged, increasing only a tenth of a percentage point from 57.1% to 57.2%. District 71 saw the largest increase in terms of black voting age population at +9.0%, however recall that this was the district that had fallen below the majority-black threshold. Closer examination of Table 8 refutes the idea that the new plan *packed* the black voting age population into districts. The new plan reduced the

concentration of black Virginians in each of the four most heavily black districts (more than 60%) as of 2009. Conversely, it was districts which contained the lowest concentrations of black VAP that were enhanced.

Table 8. Challenged Districts-Population Deviation and Racial Composition

	Population				Black VAP		
District	2009-Diff.	2009-Dev.	2011-Diff.	2011-Dev.	2009	2011	Diff.
63	-6,287	-7.9%	-408	-0.5%	58.1%	59.5%	+1.4
69	-8,711	-10.9%	-624	-0.8%	56.3%	55.2%	-1.1
70	-630	-0.8%	-628	-0.8%	61.8%	56.4%	-5.4
71	-5,816	-7.3%	312	0.4%	46.3%	55.3%	+9.0
74	143	0.2%	-416	-0.5%	62.7%	57.2%	-5.5
75	-9,556	-11.9%	-715	-0.9%	55.3%	55.4%	+.1
77	-3,083	-3.9%	-383	-0.5%	57.6%	58.8%	+1.2
80	-9,425	-11.8%	695	0.9%	54.4%	56.3%	+1.9
89	-5,751	-7.2%	-396	-0.5%	52.5%	55.5%	+3.0
90	-8,930	-11.2%	415	0.5%	56.9%	56.6%	-0.3
92	-8,993	-11.2%	-321	-0.4%	62.1%	60.7%	-1.4
95	-12,128	-15.2%	61	0.1%	61.6%	60.0%	-1.6
Mean		-8.26%		-0.25%	57.1%	57.2%	

The next table (Table 9) examines the twelve challenged districts looking at another redistricting principle: compactness. The Reock measure of district compactness in 2009 ranged from .16 to .61, while in 2011 the range was .14 to .52. Looking at the mean values for these two measures one may note that the 12 challenged districts became less compact overall (.37 versus .32). Note as well, however, that across the redistricting cycle six of these districts became more compact or saw no change and six became less

compact. The Polsby-Popper measure demonstrates a similar pattern, with the five districts becoming more compact and the average score for these districts moving from .23 to .19.[14]

Table 9. Challenged Districts-Compactness

	Compactness-Reock			Compactness-Polsby-Popper		
District	2009	2011	Diff.	2009	2011	Diff.
63	.61	.25	-.36	.48	.16	-.32
69	.37	.52	+.15	.20	.34	+.14
70	.47	.40	-.07	.14	.19	+.05
71	.24	.33	+.09	.19	.24	+.05
74	.16	.16	0	.10	.12	+.02
75	.42	.41	-.01	.22	.19	-.03
77	.18	.19	+.01	.17	.15	-.02
80	.39	.26	-.13	.26	.11	-.15
89	.58	.40	-.18	.31	.20	-.11
90	.35	.46	+.11	.24	.20	-.04
92	.28	.34	+.06	.15	.26	+.11
95	.43	.14	-.29	.28	.14	-.14
Mean	.37	.32		.23	.19	

Table 10 examines the challenged districts looking at partisan composition, population core retention, and incumbency. From 2009 to 2011 the partisan composition of these districts was essentially unchanged. The average for the DVA in 2009 was 68.3%, compared to 67.6% in 2011. Two districts (69 and 75) experienced

[14] Other House of Delegates districts also experienced drops in compactness from the benchmark (2009) to the enacted plan (2011). For example, examining Reock scores from 2009 to 2011: District 5 (.43 to .19 [-.24]); District 13 (.36 to .16 [-.20]); and District 37 (.50 to .18 [-.32]).

essentially no change in their DVA, five saw a decrease, and the remainder (5) experienced an increase. Seven districts had DVA values of 70 or higher in 2009. Four of the districts that showed a DVA decrease in 2011 were from this former group. The new plan did not, therefore, seek to *pack* Democratic voters in these districts. In 2011 the DVA ranged from a low of 50.6% to a high of 79.8%. In terms of core retention, on average, 73.2% of these districts consist of population counts retained from the previous district (2009). This figure is 6-points higher than the average district overall, at 67.2%. The last column of the table indicates that none of incumbents from these twelve districts were paired with another incumbent due to redistricting.

Table 10. Challenged Districts- Partisanship, Core Retention, and Incumbency

District	2009 DVA	2011 DVA	Diff.	Core Retention	Incumbent Paired
63	57.6%	59.3%	+1.7	82.1%	No
69	76.6%	76.6%	+0.03	74.1%	No
70	75.8%	69.2%	-6.6	67.2%	No
71	74.9%	79.8%	+4.9	80.0%	No
74	71.9%	66.2%	-5.7	79.3%	No
75	50.5%	50.6%	+0.1	78.8%	No
77	65.4%	66.0%	+0.6	74.2%	No
80	70.0%	66.7%	-3.3	62.2%	No
89	71.3%	73.1%	+1.9	76.9%	No
90	64.4%	66.5%	+2.1	63.2%	No
92	72.5%	70.1%	-2.4	77.2%	No
95	68.2%	66.5%	-1.7	62.7%	No
Mean	68.3%	67.6%		73.2%	

Having examined the twelve challenge districts what conclusions can be drawn? First, the vast majority of these districts were heavily underpopulated by the time it was necessary to redraw district lines in 2011. Action was necessary, therefore, to correct the population issue. Second, these districts had all been majority-black districts in the previous legislative plan for the House of Delegates. Another goal then was to maintain this status for these districts to prevent retrogression from taking place. As the above table indicates, this was accomplished, but not in a mechanical fashion. The percentage of the black voting age population was increased in districts having the lowest black percentages and lowered in those which had the highest concentrations. Across these districts the average black VAP was essentially unchanged from 2009 to 2011. Compactness scores for this particular set of districts shows a larger drop, as compared to the overall redistricting plan. While an important criteria in drawing district boundaries, compactness must often give way to the constitutional demand for population equality and the demands of the Voting Rights Act. It is not possible to maximize all redistricting principles simultaneously as they will, at some point, come into conflict with one another. In this case, district compactness, while a priority, was not at the top of the list. Incumbency protection, however, was an important component of the redistricting plan implemented in 2011. These districts fit that criterion as they all score high on partisan composition (in this case Democratic makeup) and core population retention. In addition, none of the incumbents representing these districts were forced to vie electorally with another incumbent in the 2011 election. In 2011, all 12 Democratic incumbents from these districts were returned to office.

VI. LEGISLATIVE ROLL-CALL ANALYSIS

Governor's Veto

Republican Governor Robert McDonnell vetoed the initial redistricting bill discharged from the Virginia General Assembly (HB 5001). The issue, according to the Governor, lay not with the plan for the House of Delegates, but with the State Senate. McDonnell's veto message raised serious reservations concerning issues of compactness and maintaining communities of interest with the Senate plan. He also indicates that population deviations between Senate districts may actually be a 14th Amendment violation. Conversely, the Governor indicates that the House plan scores well on maintaining communities of interest and keeping population deviations between districts to a minimum. He goes as far to call the Senate plan a *partisan gerrymander* and notes that not a single Republican cast a ballot in favor of passage. In contrast, the Governor *applauded the House for its bipartisan approach*, noting that the House plan passed its own chamber 86 to 8, including 28 affirmative votes from Democratic lawmakers and 11 from black members.[15]

Legislative Votes on HB 5005

After the Governor's veto of HB 5001, the Senate redistricting plan was reworked and a new bill, HB 5005, was constructed. The House plan in HB 5005 was, for the most part, largely unchanged from its configuration in HB 5001.[16] Table 11 below gives the

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[15] Governor's Veto of HB 5001. April 15, 2011. Located at: http://lis.virginia.gov/cgi-bin/legp604.exe?112+amd+HB5001AG.

[16] The population shift across these two plans amounted to 26,510 people which equates to .33% of the total population. Looking at voting age population, 19,455 people were shifted to another district (.32% of the VAP).

distribution of floor votes in the House of Delegates for HB 5005. As shown, the bill had overwhelming support with 89.9% of the delegates participating voting in the affirmative. This support was also bi-partisan in nature with all Republican delegates, three-quarters of Democrats, and both independents voting to support passage. Only nine Democrats voted against HB 5005. Four of these members had been paired with another incumbent by the plan. These four delegates accounted for 44.4% of the nay votes. Support for HB 5005 within the Black Caucus was even higher than overall Democratic support with 84.6% of this group voting yea.

Table 11. House Floor Vote on HB 5005-Initial Passage

	Yeas	Nays	Not Voting
HB 5001	89.9%	10.1%	----
	[80]	[9]	[11]
Republicans	100%	0%	----
	[52]	[0]	[7]
Democrats	74.3%	25.7%	----
	[26]	[9]	[4]
Black (D)	84.6%	15.4%	----
	[11]	[2]	[0]
Independents	100%	0%	----
	[2]	[0]	[0]

Notes: Entries are row percentages based on number in category voting. Frequencies in brackets.

After passage by the Senate with amendments relating to the Senate plan, the bill was returned to the House for final passage. Again, as demonstrated by Table 12 there is both overwhelming support

overall (90% favoring passage) and from a bi-partisan perspective as well. Again, 100% of Republicans supported passage along with 75% of Democrats. Within the Democratic caucus, 90% of Black Caucus members voting on HB 5005 were in the yea column. Again, a considerable amount of the opposition (42.9% of the nay votes) were cast by Democratic incumbents who had been paired with another incumbent.

Table 12. House Floor Vote on HB 5005-Final Adoption

	Yeas	Nays	Not Voting
HB 5001	90.0%	10.0%	----
	[63]	[7]	[30]
Republicans	100%	0%	----
	[41]	[0]	[18]
Democrats	75.0%	25.0%	----
	[21]	[7]	[11]
Black (D)	90.0%	10.0%	----
	[9]	[1]	[3]
Independents	100%	0%	----
	[1]	[0]	[1]

Notes: Entries are row percentages based on number in category voting. Frequencies in brackets.

VIII. ELECTION ANALYSIS

In this section I will compare the results of the 2009 election (previous plan) to the 2011 election for the House of Delegates (current plan). Table 13 below presents the breakdown following these two elections

by political party. From the 2009 to the 2011 elections the Republican majority in the House of Delegates increased by 8 members. The Democratic caucus lost 7 seats, and the number of unaffiliated delegates decreased from 2 members to 1.

Table 13. Seats Held by Political Party in the Virginia House of Delegates

Party	2009	2011
Republican	59%	67%
Democratic	39%	32%
Independent	2%	1%
Total	100	100

Table 14 categorizes the partisan seat distribution in the House of Delegates while examining the race of the elected members. Across the 2009 and 2011 election cycles the number of black House of Delegates members remained constant at 13. One additional Asian representative was elected along with the chamber's first Hispanic member. The largest change across these two cycles centers on the loss of white Democrats in the House of Delegates. Following the 2009 election there were 26 white Democrats. After the 2011 election this number had dropped to 17. In summary, following the 2011election the number of seats held by black members remained constant and the number of seats held by other minority groups increased by 2 (1 Hispanic and 1 Asian), while the number of white Democrats declined by nine. The redistricting plan implemented in 2011 appears then to have had the effect of increasing the number of Republican delegates at the cost of white Democrats.

Table 14. Seats Held by Political Party and Race in the Virginia House of Delegates

	2009			2011		
	Republican	Democrat	Independent	Republican	Democrat	Independent
White	58%	26%	2%	66%	17%	1%
Black	0%	13%	0%	0%	13%	0%
Hispanic	0%	0%	0%	0%	1%	0%
Asian	1%	0%	0%	1%	1%	0%
Totals	59	39	2	67	32	1

Notes: Entries are total percentages.

A more detailed look sheds some light on what made these white Democrats vulnerable in 2011. Table 15 below demonstrates that these seven white Democrats occupied districts in 2011 that were marginal from a partisan standpoint (districts that contained less than a majority of Democratic partisans). Following redistricting and just prior to the 2011 elections, there were 11 Democratically-held districts[17] in which the Democratic vote average (DVA) ranged from 25.0% to 49.9%, or less than a majority Democratic. The remaining Democratic-held districts, 28 in all, had DVA values of 50.0% or greater. None of the Republican-held districts had a DVA value greater than 49.2%.

Table 15. Partisan Seat Distribution Categorized by the Democratic Vote Average prior to the 2011 Election

	0-24.9%	25.0-49.9%	50.0-74.9%	75.0-100%	Totals
Republican	1.7%	98.3%	0%	0%	
	[1]	[58]	[0]	[0]	59
Democrat	0%	28.2%	66.7%	5.1%	

[17] Here I am categorizing seats based on the party of the incumbent holding the seat following the 2009 election.

	[0]	[11]	[26]	[2]	39
Independent	0%	100%	0%	0%	
	[0]	[2]	[0]	[0]	2

Notes: Entries are row percentages. Frequencies in brackets.

The next table examines the partisan seat distribution following the 2011 election, again categorizing districts by their DVA values. Looking at Table 16, one may note that the losses for Democratic-held seats all occurred in districts that were marginal from a partisan standpoint. Following the 2011 election, Democrats held only four seats in districts where there were less than a majority of Democratic partisans. Only 12.5% of Democratically-held seats were located in districts comprised of less than 50% of their fellow-partisans, compared to 100% of Republican-held seats which were located in districts with a majority of Republican partisans.[18]

Clearly, the redistricting plan adopted kept Democratic partisans spread across far more districts, whereas Republican partisans were more concentrated. This was especially detrimental for white Democrats occupying marginal seats from a partisan perspective. From the standpoint of judging the implemented redistricting plan from a post-election perspective one can state the following: the GOP-majority in the House of Delegates was augmented; racial/ethnic minorities in Virginia realized representational gains;

[18] The incumbent pairings also produced six open seats. Based on the party that previously held these open seats, four were occupied by Democrats and two by Republicans. Following the 2011 election, the GOP gained three of these seats and retained two others, leaving the Democrats in control of only one of these seats.

and the number of white Democrats was diminished. On the other hand, the ability of black Virginians to elect their preferred candidates was retained by the new 2011 plan.

Table 16. Partisan Seat Distribution Categorized by the Democratic Vote Average following the 2011 Election

	0-24.9%	25.0-49.9%	50.0-74.9%	75.0-100%	Totals
Republican	1.5%	98.5%	0%	0%	
	[1]	[66]	[0]	[0]	67
Democrat	0%	12.5%	81.3%	6.3%	
	[0]	[4]	[26]	[2]	32
Independent	0%	100%	0%	0%	
	[0]	[1]	[0]	[0]	1

Notes: Entries are row percentages. Frequencies in brackets.

IX. OVERALL OPINION

After having analyzed the 2011 Virginia House of Delegates districting plan I have reached a number of conclusions. First, the plan implemented in 2011 meets the criteria of having districts with equal population counts. Deviations across all districts range between +/-1% from the ideal district size.

The plan received overwhelming bi-partisan support with large majorities of Republicans and Democrats voting in favor of passage. This support also included a super-majority of the Black Caucus in the House of Delegates. Viewed from the standpoint of goals to be accomplished, one could term the design as primarily an incumbent protection plan. Indeed, only a small set of incumbents are paired under the 2011 plan and the average district retained more than two-thirds of

its former voters.[19] The former observation helps to explain, to a large degree, the noted support from delegates within the House.

To the extent a secondary political purpose can be detected, it would involve an effort to diffuse Democratic voting strength across Democratically-held districts, while simultaneously maintaining higher concentrations of GOP partisans in Republican-held districts. As demonstrated, no Republican-held district contained less than a majority of fellow partisans. On the other hand, with the new districting plan 11 Democratically-held seats contained somewhere less than a majority of Democratic partisans. An increase in marginal Democratic districts resulted, not surprisingly, in additional seat pickups for the Republicans in the 2011 election-cycle.

It should also be noted that this loss in Democratic-held seats did not come at the expense of minority legislators. In fact, from 2009 to 2011 the number of minority legislators increased by two with the addition of another Asian member and the chamber's first Hispanic delegate. The number of Black Caucus members stayed constant across the redistricting cycle as did the number of majority-black districts. All GOP seat pickups came at the expense of white Democrats (and one white Independent). Such marks a continued trend in Southern politics more recently where Republican gains have been realized at the cost of white Democrats. Moreover, these results are in line with the outcome that one would expect from a plan

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[19] For comparison, two alternative plans offered by the Democrats contained many more paired incumbents. Plan 4 had 23 incumbent pairings and Plan 5 contained 16.

drawn by a political party to leverage their majority status.

X. DECLARATION

I declare under penalty of perjury under the laws of the United States that the foregoing is true and correct to the best of my knowledge.

Executed on April 10, 2015.

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Education

Ph.D.	Political Science	Texas Tech University	1997
M.A.	Political Science	Baylor University	1993
B.S.	Political Science	Texas A&M University	1991

Peer-Reviewed Books

The Rational Southerner: Black Mobilization, Republican Growth, and the Partisan Transformation of the American South. 2012. New York: Oxford University Press.
(Quentin Kidd and Irwin L. Morris, co-authors).
[Softcover version in 2014 with new Epilogue]

Peer-Reviewed Publications

"Tea Leaves and Southern Politics: Explaining Tea Party Support Among Southern Republicans." Forthcoming 2015. *Social Science Quarterly*. (Quentin Kidd and Irwin L. Morris, co-authors).

"True Colors: White Conservative Support for Minority Republican Candidates." 2015. *Public Opinion Quarterly* 79(1): 28-52. (Seth C. McKee, co-author).

"Race and the Tea Party in the Old Dominion: Split-Ticket Voting in the 2013 Virginia Elections." 2015. *PS: Political Science and Politics* 48(1):107-114. (Quentin Kidd and Irwin L. Morris, co-authors).

"The Damnedest Mess: An Empirical Evaluation of the 1966 Georgia Gubernatorial Election." Forthcoming 2014. *Social Science Quarterly*. (Charles S. Bullock, III, co-author).

"Candidates, Competition, and the Partisan Press: Congressional Elections in the Early Antebellum Era." 2014. *American Politics Research* 42(5):670-783. (Jamie L. Carson, co- author).
[Winner of the 2014 Hahn-Sigelman Prize]

"Strategic Voting in a U.S. Senate Election." 2013. *Political Behavior* 35(4):729-751. (Seth C. McKee, co-author).

"Unwelcome Constituents: Redistricting and Countervailing Partisan Tides." 2013. *State Politics and Policy Quarterly* 13(2):203-224. (Seth C. McKee, co-author).

"The Tea Party, Sarah Palin, and the 2010 Congressional Elections: The Aftermath of the Election of Barack Obama." 2012. *Social Science Quarterly* 93(5):1424-1435. (Charles S. Bullock, III, co-author).

"Much Ado About Nothing?: An Empirical Assessment of the Georgia Voter Identification Statute." 2012. *State Politics and Policy Quarterly* 12(4):394-314. (Charles S. Bullock, III, co-author).

"Achieving Validation: Barack Obama and Black Turnout in 2008." 2012. *State Politics and Policy Quarterly* 12:3-22. (Seth C. McKee and David Hill, co-authors).

"They Just Don't Vote Like They Used To: A Methodology to Empirically Assess Election Fraud." 2012. *Social Science Quarterly* 93:76-94. (William Gillespie, co-author).

"An Examination of Efforts to Encourage the Incidence of Early In-Person Voting in Georgia, 2008." 2011. *Election Law Journal* 10:103-113. (Charles S. Bullock, III, co- author).

"What Made Carolina Blue? In-migration and the 2008 North Carolina Presidential Vote." 2010. *American Politics Research* 38:266-302. (Seth C. McKee, co-author).

"Stranger Danger: Redistricting, Incumbent Recognition, and Vote Choice." 2010. *Social Science Quarterly* 91:344-358. (Seth C. McKee, co-author).

"Trying to Thread the Needle: The Effects of Redistricting in a Georgia Congressional District." 2009.

PS: Political Science and Politics 42:679-687. (Seth C. McKee, co-author).

"Citizen, Defend Thyself: An Individual-Level Analysis of Concealed-Weapon Permit Holders." 2009. *Criminal Justice Studies* 22:73-89. (Grant W. Neeley, co-author).

"Two Sides of the Same Coin?: Employing Granger Causality Tests in a Time Series Cross- Section Framework." 2008. *Political Analysis* 16:324-344. (Quentin Kidd and Irwin L. Morris, co-authors).

"Worth a Thousand Words? : An Analysis of Georgia's Voter Identification Statute." 2008. *American Politics Research* 36:555-579. (Charles S. Bullock, III, co-author).

"Gerrymandering on Georgia's Mind: The Effects of Redistricting on Vote Choice in the 2006 Midterm Election." 2008. *Social Science Quarterly* 89:60-77 (Seth C. McKee, co- author).

"Examining Methods for Identifying Latino Voters." 2007. *Election Law Journal* 6:202-208. (Charles S. Bullock, III, co-author).

"A Mile-Wide Gap: The Evolution of Hispanic Political Emergence in the Deep South." 2006. *Social Science Quarterly* 87:1117-1135. (Charles S. Bullock, III, co-author).

"Punch Cards, Jim Crow, and Al Gore: Explaining Voter Trust in the Electoral System in Georgia, 2000." 2005. *State Politics and Policy Quarterly* 5:283-294. (Charles S. Bullock, III and Richard Clark, co-authors).

"When Southern Symbolism Meets the Pork Barrel: Opportunity for Executive Leadership." 2005. *Social*

Science Quarterly 86:69-86. (Charles S. Bullock, III, co-author).

"The Reintroduction of the *Elephas maximus* to the Southern United States: The Rise of Republican State Parties, 1960-2000." 2004. *American Politics Research* 31:68-101. (Quentin Kidd and Irwin Morris, co-authors).

"One Person, [No Vote; One Vote; Two Votes...]: Voting Methods, Ballot Types, and Undervote Frequency in the 2000 Presidential Election." 2002. *Social Science Quarterly* 83:981-993. (Charles S. Bullock, III, co-author).

"On the Prospect of Linking Religious Right Identification with Political Behavior: Panacea or Snipe Hunt?" 2002. *Journal for the Scientific Study of Religion* 41:697-710. (Mark C. Smith, co-author).

"The *Key* Issue: Constituency Effects and Southern Senators' Roll-Call Voting on Civil Rights." 2001. *Legislative Studies Quarterly* 26: 599-621. (Quentin Kidd and Irwin Morris, co- authors).

"Packin' in the Hood?: Examining Assumptions Underlying Concealed-Handgun Research." 2000. *Social Science Quarterly* 81:523-537. (Grant Neeley, co-author).

"Brother, Can You Spare a Dime? Racial/Ethnic Context and the Anglo Vote on Proposition 187." 2000. *Social Science Quarterly* 81:194-206. (Irwin Morris, co-author).

"Penny Pinching or Politics? The Line-Item Veto and Military Construction Appropriations." 1999. *Political Research Quarterly* 52:753-766. (Irwin Morris and Grant Neeley, coauthors).

"Of Byrds[s] and Bumpers: Using Democratic Senators to Analyze Political Change in the South, 1960-1995." 1999. *American Journal of Political Science* 43:465-487. (Quentin Kidd and Irwin Morris, co-authors).

"Bugs in the NRC's Doctoral Program Evaluation Data: From Mites to Hissing Cockroaches." 1998. *PS* 31:829-835. (Nelson Dometrius, Quentin Kidd, and Kurt Shirkey, co-authors).

"Boll Weevils and Roll-Call Voting: A Study in Time and Space." 1998. *Legislative Studies Quarterly* 23:245-269. (Irwin Morris, co-author).

"Give Us Your Tired, Your Poor,...But Make Sure They Have a Green Card: The Effects of Documented and Undocumented Migrant Context on Anglo Opinion Towards Immigration." 1998. *Political Behavior* 20:1-16. (Irwin Morris, co-author).

"¡Quedate o Vente!: Uncovering the Determinants of Hispanic Public Opinion Towards Immigration." 1997. *Political Research Quarterly* 50:627-647. (Irwin Morris and Kurt Shirkey, co-authors).

"¿Amigo o Enemigo?: Context, Attitudes, and Anglo Public Opinion toward Immigration." 1997. *Social Science Quarterly* 78: 309-323. (Irwin Morris, co-author).

Invited Publications

"Race and the Ideological Transformation of the Democratic Party: Evidence from the Bayou State." 2005. *American Review of Politics* 25:67-78.

Book Chapters

"The Participatory Consequences of Florida Redistricting." Forthcoming 2015. In *Jigsaw Puzzle*

Politics in the Sunshine State, Seth C. McKee, editor. Gainesville, FL: University of Florida Press. (Danny Hayes and Seth C. McKee, co-authors).

"Texas: Political Change by the Numbers." 2014. In *The New Politics of the Old South, 5th ed.*, Charles S. Bullock, III and Mark J. Rozell, editors. New York: Rowman and Littlefield Publishers, Inc. (Seth C. McKee, co-author).

"The Republican Party in the South." 2012. In *Oxford Handbook of Southern Politics*, Charles S. Bullock, III and Mark J. Rozell, editors. New York: Oxford University Press. (Quentin Kidd and Irwin Morris, co-authors).

"The Reintroduction of the *Elephas maximus* to the Southern United States: The Rise of Republican State Parties, 1960-2000." 2010. In *Controversies in Voting Behavior*, 5th ed., David Kimball, Richard G. Niemi, and Herbert F. Weisberg, editors. Washington, DC: CQ Press. (Quentin Kidd and Irwin Morris, co-authors).
[Reprint of 2004 *APR* article with Epilogue containing updated analysis and other original material.]

"The Texas Governors." 1997. In *Texas Policy and Politics*, Mark Somma, editor. Needham Heights, MA: Simon & Schuster.

Other Publications

"Provisionally Admitted College Students: Do They Belong in a Research University?" 1998. In *Developmental Education: Preparing Successful College Students*, Jeanne Higbee and Patricia L. Dwinell, editors. Columbia, SC: National Resource

Center for the First-Year Experience & Students in Transition (Don Garnett, co-author).

NES Technical Report No. 52. 1994. "The Reliability, Validity, and Scalability of the Indicators of Gender Role Beliefs and Feminism in the 1992 American National Election Study: A Report to the ANES Board of Overseers." (Sue Tolleson-Rinehart, Douglas R. Davenport, Terry L. Gilmour, William R. Moore, Kurt Shirkey, co-authors).

Grant-funded Research (UGA)

Co-Principal Investigator. "An Examination of Non-Precinct Voting in the State of Georgia." Budget: $47,000. October 2008-July 2009. (with Charles S. Bullock, III). Funded by the Pew Charitable Trust.

Co-Principal Investigator. "The Best Judges Money Can Buy?: Campaign Contributions and the Texas Supreme Court." (SES-0615838) Total Budget: $166,576; UGA Share: $69,974. September 2006-August 2008. (with Craig F. Emmert). Funded by the National Science Foundation. REU Supplemental Award (2008-2009): $6,300.

Principal Investigator. "Payola Justice or Just Plain 'Ole Politics Texas-Style?: Campaign Finance and the Texas Supreme Court." $5,175. January 2000-Januray 2001. Funded by the University of Georgia Research Foundation, Inc.

Curriculum Grants (UGA)

Learning Technology Grant: "Converting Ideas Into Effective Action: An Interactive Computer and Classroom Simulation for the Teaching of American Politics." $40,000. January-December 2004. (with Loch Johnson). Funded by the Office of Instructional Support and Technology, University of Georgia.

Dissertation

"Capturing Bubba's Heart and Mind: Group Consciousness and the Political Identification of Southern White Males, 1972-1994."

Chair: Professor Sue Tolleson-Rinehart

Papers and Activities at Professional Meetings

"Race and the Tea Party in the Old Dominion: Split-Ticket Voting in the 2013 Virginia Elections." (with Irwin L. Morris and Quentin Kidd). 2014. Paper presented at the Citadel Symposium on Southern Politics. Charleston, SC.

"Race and the Tea Party in the Old Dominion: Down-Ticket Voting and Roll-Off in the 2013 Virginia Elections." (with Irwin L. Morris and Quentin Kidd). 2014. Paper presented at the Annual Meeting of the Southern Political Science Association. New Orleans, LA.

"Tea Leaves and Southern Politics: Explaining Tea Party Support Among Southern Republicans." (with Irwin L. Morris and Quentin Kidd). 2013. Paper presented at the Annual Meeting of the Southern Political Science Association. Orlando, FL.

"The Tea Party and the Southern GOP." (with Irwin L. Morris and Quentin Kidd). 2012. Research presented at the Effects of the 2012 Elections Conference. Athens, GA.

"Black Mobilization in the Modern South: When Does Empowerment Matter?" (with Irwin L. Morris and Quentin Kidd). 2012. Paper presented at the Citadel Symposium on Southern Politics. Charleston, SC.

"The Legislature Chooses a Governor: Georgia's 1966 Gubernatorial Election." (with Charles S. Bullock,

III). 2012. Paper presented at the Citadel Symposium on Southern Politics. Charleston, SC.

"One-Stop to Victory? North Carolina, Obama, and the 2008 General Election." (with Justin Bullock, Paul Carlsen, Perry Joiner, and Mark Owens). 2011. Paper presented at the Annual Meeting of the Southern Political Science Association. New Orleans.

"Redistricting and Turnout in Black and White." (with Seth C. McKee and Danny Hayes). 2011. Paper presented the Annual Meeting of the Midwest Political Science Association. Chicago, IL.

"One-Stop to Victory? North Carolina, Obama, and the 2008 General Election." (with Justin Bullock, Paul Carlsen, Perry Joiner, Jeni McDermott, and Mark Owens). 2011. Paper presented at the Annual Meeting of the Midwest Political Science Association Meeting. Chicago, IL.

"Strategic Voting in the 2010 Florida Senate Election." (with Seth C. McKee). 2011. Paper Presented at the Annual Meeting of the Florida Political Science Association. Jupiter, FL.

"The Republican Bottleneck: Congressional Emergence Patterns in a Changing South." (with Christian R. Grose and Seth C. McKee). Paper presented at the Annual Meeting of the Southern Political Science Association. New Orleans, LA.

"Capturing the Obama Effect: Black Turnout in Presidential Elections." (with David Hill and Seth C. McKee) 2010. Paper presented at the Annual Meeting of the Florida Political Science Association. Jacksonville, FL.

"The Republican Bottleneck: Congressional Emergence Patterns in a Changing South." (with Seth C. McKee and Christian R. Grose). 2010. Paper presented at the Citadel Symposium on Southern Politics. Charleston, SC.

"Black Mobilization and Republican Growth in the American South: The More Things Change the More They Stay the Same?" (with Quentin Kidd and Irwin L. Morris). 2010. Paper presented at the Citadel Symposium on Southern Politics. Charleston, SC.

"Unwelcome Constituents: Redistricting and Incumbent Vote Shares." (with Seth C. McKee). 2010. Paper presented at the Annual Meeting of the Southern Political Science Association. Atlanta, GA.

"Black Mobilization and Republican Growth in the American South: The More Things Change the More They Stay the Same?" (with Quentin Kidd and Irwin L. Morris). 2010. Paper presented at the Annual Meeting of the Southern Political Science Association. Atlanta, GA.

"The Impact of Efforts to Increase Early Voting in Georgia, 2008." (With Charles S. Bullock, III). 2009. Presentation made at the Annual Meeting of the Georgia Political Science Association. Callaway Gardens, GA.

"Encouraging Non-Precinct Voting in Georgia, 2008." (With Charles S. Bullock, III). 2009. Presentation made at the Time-Shifting The Vote Conference. Reed College, Portland, OR.

"What Made Carolina Blue? In-migration and the 2008 North Carolina Presidential Vote." (with Seth C. McKee). 2009. Paper presented at the Annual

Meeting of the Florida Political Science Association. Orlando, FL.

"Swimming with the Tide: Redistricting and Voter Choice in the 2006 Midterm." (with Seth C. McKee). 2009. Paper presented at the Annual Meeting of the Midwest Political Science Association. Chicago.

"The Effect of the Partisan Press on U.S. House Elections, 1800-1820." (with Jamie Carson). 2008. Paper presented at the Annual Meeting of the History of Congress Conference. Washington, D.C.

"Backward Mapping: Exploring Questions of Representation via Spatial Analysis of Historical Congressional Districts." (Michael Crespin). 2008. Paper presented at the Annual Meeting of the History of Congress Conference. Washington, D.C.

"The Effect of the Partisan Press on U.S. House Elections, 1800-1820." (with Jamie Carson). 2008. Paper presented at the Annual Meeting of the Midwest Political Science Association. Chicago.

"The Rational Southerner: The Local Logic of Partisan Transformation in the South." (with Quentin Kidd and Irwin L. Morris). 2008. Paper presented at the Citadel Symposium on Southern Politics. Charleston, SC.

"Stranger Danger: The Influence of Redistricting on Candidate Recognition and Vote Choice." (with Seth C. McKee). 2008. Paper presented at the Annual Meeting of the Southern Political Science Association. New Orleans.

"Backward Mapping: Exploring Questions of Representation via Spatial Analysis of Historical Congressional Districts." (with Michael Crespin).

2007. Paper presented at the Annual Meeting of the American Political Science Association. Chicago.

"Worth a Thousand Words? : An Analysis of Georgia's Voter Identification Statute." (with Charles S. Bullock, III). 2007. Paper presented at the Annual Meeting of the Southwestern Political Science Association. Albuquerque.

"Gerrymandering on Georgia's Mind: The Effects of Redistricting on Vote Choice in the 2006 Midterm Election." (with Seth C. McKee). 2007. Paper presented at the Annual Meeting of The Southern Political Science Association. New Orleans.

"Personalismo Politics: Partisanship, Presidential Popularity and 21st Century Southern Politics." (with Quentin Kidd and Irwin L. Morris). 2006. Paper presented at the Annual Meeting of the American Political Science Association. Philadelphia.

"Explaining Soft Money Transfers in State Gubernatorial Elections." (with William Gillespie and Troy Gibson). 2006. Paper presented at the Annual Meeting of the Midwest Political Science Association. Chicago.

"Two Sides of the Same Coin?: A Panel Granger Analysis of Black Electoral Mobilization and GOP Growth in the South, 1960-2004." (with Quentin Kidd and Irwin L. Morris). 2006. Paper presented at the Citadel Symposium on Southern Politics. Charleston, SC.

"Hispanic Political Emergence in the Deep South, 2000-2004." (With Charles S. Bullock, III). 2006. Paper presented at the Citadel Symposium on Southern Politics. Charleston.

"Black Mobilization and the Growth of Southern Republicanism: Two Sides of the Same Coin?" (with Quentin Kidd and Irwin L. Morris). 2006. Paper presented at the Annual Meeting of the Southern Political Science Association. Atlanta.

"Exploring the Linkage Between Black Turnout and Down-Ticket Challenges to Black Incumbents." (With Troy M. Gibson). 2006. Paper presented at the Annual Meeting of the Southern Political Science Association Atlanta.

"Race and the Ideological Transformation of the Democratic Party: Evidence from the Bayou State." 2004. Paper presented at the Biennial Meeting of the Citadel Southern Politics Symposium. Charleston.

"Tracing the Evolution of Hispanic Political Emergence in the Deep South." 2004. (Charles S. Bullock, III). Paper presented at the Biennial Meeting of the Citadel Southern Politics Symposium. Charleston.

"Much Ado about Something? Religious Right Status in American Politics." 2003. (With Mark C. Smith). Paper presented at the Annual Meeting of the Midwest Political Science Association. Chicago.

"Tracking the Flow of Non-Federal Dollars in U. S. Senate Campaigns, 1992-2000." 2003. (With Janna Deitz and William Gillespie). Paper presented at the Annual Meeting of the Midwest Political Science Association. Chicago.

"PAC Cash and Votes: Can Money Rent a Vote?" 2002. (With William Gillespie). Paper presented at the Annual Meeting of the Southern Political Science Association. Savannah.

"What Can Gubernatorial Elections Teach Us About American Politics?: Exploiting and Underutilized

Resource." 2002. (With Quentin Kidd and Irwin L. Morris). Paper presented at the Annual Meeting of the American Political Science Association. Boston.

"I Know I Voted, But I'm Not Sure It Got Counted." 2002. (With Charles S. Bullock, III and Richard Clark). Paper presented at the Annual Meeting of the Southwestern Social Science Association. New Orleans.

"Race and Southern Gubernatorial Elections: A 50-Year Assessment." 2002. (With Quentin Kidd and Irwin Morris). Paper presented at the Biennial Southern Politics Symposium. Charleston, SC.

"Top-Down or Bottom-Up?: An Integrated Explanation of Two-Party Development in the South, 1960-2000." 2001. Paper presented at the Annual Meeting of the Southern Political Science Association. Atlanta.

"Cash, Congress, and Trade: Did Campaign Contributions Influence Congressional Support for Most Favored Nation Status in China?" 2001. (With William Gillespie). Paper presented at the Annual Meeting of the Southwestern Social Science Association. Fort Worth.

"Key 50 Years Later: Understanding the Racial Dynamics of 21st Century Southern Politics" 2001. (With Quentin Kidd and Irwin Morris). Paper presented at the Annual Meeting of the Southern Political Science Association. Atlanta.

"The VRA and Beyond: The Political Mobilization of African Americans in the Modern South." 2001. (With Quentin Kidd and Irwin Morris). Paper presented at the Annual Meeting of the American Political Science Association. San Francisco.

"Payola Justice or Just Plain 'Ole Politics Texas Style?: Campaign Finance and the Texas Supreme Court." 2001. (With Craig Emmert). Paper presented at the Annual Meeting of the Midwest Political Science Association. Chicago.

"The VRA and Beyond: The Political Mobilization of African Americans in the Modern South." 2000. (With Irwin Morris and Quentin Kidd). Paper presented at the Annual Meeting of the Southern Political Science Association. Atlanta.

"Where Have All the Republicans Gone? A State-Level Study of Southern Republicanism." 1999. (With Irwin Morris and Quentin Kidd). Paper presented at the Annual Meeting of the Southern Political Science Association. Savannah.

"Elephants in Dixie: A State-Level Analysis of the Rise of the Republican Party in the Modern South." 1999. (With Irwin Morris and Quentin Kidd). Paper presented at the Annual Meeting of the American Political Science Association. Atlanta.

"Stimulant to Turnout or Merely a Convenience?: Developing an Early Voter Profile." 1998. (With Quentin Kidd and Grant Neeley). Paper presented at the Annual Meeting of the Southern Political Science Association. Atlanta.

"The Impact of the Texas Concealed Weapons Law on Crime Rates: A Policy Analysis for the City of Dallas, 1992-1997." 1998. (With Grant W. Neeley). Paper presented to the Annual Meeting of the Midwest Political Science Association. Chicago.

"Analyzing Anglo Voting on Proposition 187: Does Racial/Ethnic Context Really Matter?" 1997. (With Irwin Morris). Paper presented to the Annual

Meeting of the Southern Political Science Association. Norfolk.

"Capturing Bubba's Heart and Mind: Group Consciousness and the Political Identification of Southern White Males, 1972-1994." 1997. Paper presented at the Annual Meeting of the Midwest Political Science Association. Chicago.

"Of Byrds[s] and Bumpers: A Pooled Cross-Sectional Study of the Roll-Call Voting Behavior of Democratic Senators from the South, 1960-1995." 1996. (With Quentin Kidd and Irwin Morris). Paper presented to the Annual Meeting of the Southern Political Science Association. Atlanta.

"Pest Control: Southern Politics and the Eradication of the Boll Weevil." 1996. (With Irwin Morris). Paper presented to the Annual Meeting of the American Political Science Association. San Francisco.

"Fit for the Greater Functions of Politics: Gender, Participation, and Political Knowledge." 1996. (With Terry Gilmour, Kurt Shirkey, and Sue Tolleson-Rinehart). Paper presented to the Annual Meeting of the Midwest Political Science Association. Chicago.

"¿Amigo o Enemigo?: Racial Context, Attitudes, and White Public Opinion on Immigration." 1996. (With Irwin Morris). Paper presented to the Annual Meeting of the Midwest Political Science Association. Chicago.

"¡Quedate o Vente!: Uncovering the Determinants of Hispanic Public Opinion Towards Immigration." 1996. (With Irwin Morris and Kurt Shirkey). Paper presented to the Annual Meeting of the Southwestern Political Science Association. Houston.

"Downs Meets the Boll Weevil: When Southern Democrats Turn Left." 1995. (With Irwin Morris). Paper presented to the Annual Meeting of the Southern Political Science Association. Tampa.

"¿Amigo o Enemigo?: Ideological Dispositions of Whites Residing in Heavily Hispanic Areas." 1995. (With Irwin Morris). Paper presented to the Annual Meeting of the Southern Political Science Association. Tampa.

Chair. Panel titled "Congress and Interest Groups in Institutional Settings." 1995. Annual Meeting of the Southwestern Political Science Association. Dallas.

"Death of the Boll Weevil?: The Decline of Conservative Democrats in the House." 1995. (With Kurt Shirkey). Paper presented to the Annual Meeting of the Southwestern Political Science Association. Dallas.

"Capturing Bubba's Heart and Mind: The Political Identification of Southern White Males." 1994. (With Sue Tolleson-Rinehart). Paper presented to the Annual Meeting of the Southern Political Science Association. Atlanta.

Other Professional Presentations

"Much Adieu About Nothing?: An Empirical Assessment of Georgia's Voter Identification Statute." 2010. Presentation made to the Department of Political Science, Texas Tech University. Lubbock, TX.

"Report on the Aftermath of the 2010 Midterm Elections." 2010. Presentation made to the Oconee County Republican Party. Watkinsville, GA.

"Non-Precinct Voting in Georgia-A Survey of Voters from the 2008 Election." 2010. Presentation made to the Jeannette Rankin Foundation Program: The Life and Legacy of Jeannette Rankin: Championing Election Reform. Athens, GA.

"Non-Precinct Voting in Georgia, 2008." (With Charles S. Bullock, III). Presentation made at the Annual Meeting of the Georgia Election Officials Association. Savannah.

Areas of Teaching Competence

American Politics: Behavior and Institutions Public Policy
Scope, Methods, Techniques
Teaching Experience

University of Georgia, 1999-present.
Director of Graduate Studies, 2011-present.
Graduate Faculty, 2003-present.
Provisional Graduate Faculty, 2000-2003.
Distance Education Faculty, 2000-present.

Texas Tech University, 1993-1999.

Visiting Faculty, 1997-1999.
Graduate Faculty, 1998-1999.
Extended Studies Faculty, 1997-1999.
Teaching Assistant, 1993-1997.

Courses Taught:
Undergraduate:
American Government and Politics, American Government and Politics (Honors), Legislative Process, Introduction to Political Analysis, American Public Policy, Political Psychology, Advanced Simulations in American Politics (Honors), Southern Politics, Southern Politics (Honors)

Graduate:

Election Administration and Related Issues, Political Parties and Interest Groups, Legislative Process, Seminar in American Politics, Southern Politics; Publishing for Political Science

Editorial Boards

Social Science Quarterly. Member. 2011-present.

Election Law Journal. Member. 2013-present.

Institutional Service (University-Level)

University Program Review Committee, 2009-2011.
Chair, 2010-2011
Vice-Chair, 2009-2010.

Graduate Council, 2005-2008.
Program Committee, 2005-2008.
Chair, Program Committee, 2007-2008.

University Libraries Committee, 2004-2014.

Search Committee for University Librarian and Associate Provost, 2014.

EXPERT REPORT FOR *BETHUNE-HILL V. VIRGINIA STATE BOARD OF ELECTIONS*

Jonathan N. Katz

April 10, 2015

I asked by legal counsel in this case to examine the reapportionment plan for the Virginia House of Delegates under the map enacted by the Virginia General Assembly in 2011 in HB 5005 as well under the map in place from 2001 until 2011, the Benchmark Map. In particular, I was asked to examine the geographical compactness and the racial composition of the legislative districts as well as voting patterns. I was to pay specific attention to the twelve challenged House districts (HDs 63, 69, 70, 71, 74, 75, 77, 80, 89, 90, 92, and 95), which I will refer to as the "Challenged Districts". In particular, I was asked to assess whether African-Americans in these districts have the ability to elect the preferred candidate of their choice and whether it appears that the General Assembly packed African-Americans into these districts to dilute the voting strength of minorities in other districts. In addition to providing my own analyses and opinions, I was asked to provide my opinions on the analysis and conclusions of Dr. Stephen Ansolabehere as detailed in his expert report dated March 11, 2015. In making my findings, I have applied standard statistical methods, which I regularly employ in my research and which have been published in peer-reviewed journals

A summary of my report and basic findings is as follows:

- Dr. Ansolabehere's choice of the particular compactness measure used in his analysis is arbitrary and not justified. Using an alternative and more justified measure of compactness, I show

that the HB 5005 map is as compact as the Benchmark map.

- Dr. Ansolabehere's ecological regression analysis of racially polarized voting is flawed using a discredited statistical method and does not examine the most relevant elections, those for the House of Delegates.
- I show that elections for the Virginia House of Delegates in the Contested Districts show substantial racially polarized voting using the currently accepted statistical methodology.
- In the Contested Districts, my analysis shows that a Black voting population of 55% predicts only an 80% chance of a Black candidate winning that district.
- I show that Dr. Ansolabehere's results on the inclusion of particular VTDs in the Contested districts is overwhelmingly predicted by its racial composition is incorrect as he did not account for geographical distance in his analysis.

In the next section of the report I review my qualifications. In section 2, I discuss and analyze the compactness of the legislative maps. Section 3 examines Dr. Ansolabehere's ecological regression analyses. The final section presents my own analysis of racial polarization and the racial packing of the Contested Districts.

1. QUALIFICATIONS

I am currently the Kay Sugahara Professor of Social Sciences and Statistics at the California Institute of Technology. I was also formerly on the faculty at the University of Chicago and a visiting Dr. at the

University of Konstanz (Germany). A complete copy of my curriculum vitae is in the Appendix.

I received my Bachelor of Science degree from the Massachusetts Institute of Technology and my Masters of Arts and Doctor of Philosophy degrees, both in political science, from the University of California, San Diego. I have also done post-doctoral work at Harvard University and the Harvard-MIT Data Center. I am an elected fellow of both the American Academy of Arts and Sciences and the Society for Political Methodology. I am a former fellow of the Center for Advanced Study in the Behavioral Sciences.

I have written numerous articles published in the leading journals as set forth in my curriculum vitae. I am currently the co-editor of Political Analysis, the journal of the Society for Political Methodology[1], and I am a co-founding editor of the Political Science network (a collection of online journals). I sit on the editorial board of two leading journals, Electoral Studies and Political Research Quarterly, and I previously also served on the editorial board of the American Journal of Political Science. I have also served as a referee of manuscripts for most of the major journals in my fields of research and for the National Science Foundation.

I have done extensive research on American elections and on statistical methods for analyzing political science data. I am a member of the Caltech/MIT Voting Technology Project, serving as the co-director of the project from October 1, 2005 to September 30, 2010.

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[1] Political methodology is the development of statistical and research tools in political science.

Over the past decade, I have testified or consulted in numerous elections cases for both Democratic and Republican clients involving the Federal Voting Rights Act, the evaluation of voting systems, or the statistical evaluation of electoral data. I have testified or consulted in court cases in both state and Federal courts in the states of Arizona, California, Florida, Georgia, Indiana, Illinois, Maryland, Michigan, Missouri, New Mexico, Nevada, Oklahoma, Texas, and Washington.

2. COMPACTNESS

Compactness is a concept related to whether or not a district is closely or neatly packed together. Shapes such as circles and hexagons are relatively compact, and so districts that look like them are considered to be more compact then winding districts with boarders that have many twists and turns. In an effort to quantify compactness, scholars have employed more than 20 distinct measures to evaluate legislative districts throughout the United States.[2] Unfortunately, these measures can often lead to different conclusions about a given plans compactness[3].

In Dr. Ansolabehere's report, he chose to use the Reock measure from this large array of compactness measures for his analysis, but he used no theoretical or empirical justification for its application in Virginia. There is no indication whether this measure is appropriate for the data at hand or instead whether it was cherry picked to support the plantiff's case.

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[2] See Niemi et al. (1990)

[3] Altman (1998, chapter 5), Niemi et al. (1990), and Young (1988)

Reock measure is based on the idea that a circle is the most compact geometric shape, and it therefore computes the ratio of the area of each district to the area of the minimum bounding circle enclosing that district. Unfortunately, Reock and similar measures based on circle geometry have several serious limitations. I discuss these flaws below.

Since the academic literature does not identify a definitive standard by which to evaluate compactness, the determination of whether or not the Challenged Districts and the remaining districts throughout the state should not be based on one ad hoc choice and certainly not on one measure alone. Further, if one measure were chosen it would likely not be Reock.

Thus, I provide here an alternative measure of compactness that is based on an academic standard used and cited in the academic literature almost three times as often as Earnest Reock's original paper, and that avoids key challenges befalling Reock and similar measures based on circle geometry. I first discuss the flaws of the Reock measure and then discuss the results from the better measure that I introduce.

2.1. *Inappropriateness of the Reock Measure for Virginia Districts*

The first important limitation of the Reock measure is that it consistently penalizes districts that are long and narrow, or that have long and narrow sections — even if these districts have fixed state borders or other reasons for these shapes. This occurs because a long district will necessarily produce a minimum bounding circle with a large diameter. Since the area of the resulting minimum bounding circle is a function of its diameter, a long district will typically produce a minimum bounding circle with an area much larger

than its own. In fact, Virginia as a whole displays this elongated shape.

An example of this narrowness penalty can be seen in Figure 1 which displays the maps of Districts 4 and 66. While District 4 does not appear visually to be substantially more compact than District 66 — note especially the many turns and arms off the shape on the right —the latter has a much lower Reock score as a result of its narrower shape.[4] This happens because the Reocks measure ignores everything about the shape of the district except for the diamater of the bounding circle.

The Reock measure applies its penalty to long, narrow districts even when their shape is constrained by state lines, coastlines, or other features that cannot be altered in the process of drawing districts. District 1 illustrates this point as can be seen Figure 2.

Figure 1: Maps of Districts 66 (Left) and 4 (Right) in HB 5005

[4] Approximately 0.25 for District 66 and 0.41 for District 4

This district has a low Reock score[5] The area shaded in dark blue represents the area within District 1.

The area shaded in light blue represents the only area in the minimum bounding circle that actually falls within the state of Virginia. All of the remaining area falls within Kentucky and Tennessee. While it is feasible to draw a district which contains all of the light blue area within this bounding circle, it is not feasible to draw a district that includes area in neighboring states.

In other words, Dr. Ansolabehere uses a measure that judges the compactness of District 1 badly because of the unalterable shape of Virginia. Clearly the shape of the entire state of Virginia cannot be changed as a result of this redistricting, and people living in neighboring states have nothing to do with the compactness of districts within Virginia.

As a result, the Reock score for District 1, as well as other districts similarly bordered by features that cannot be included in their area, will always be low. These low Reock scores, however, would not be indicative of any attempt to strategically include or exclude certain areas of the state.

Further, the Reock measure can likewise reward a district that is "arbitrarily misshapen", so long as it "meanders around within a confined area."[6] Districts 2 and 17 both serve to illustrate this point as can be seen in Figure 3. While District 17 appears less compact than District 2, District 17 scores higher on the Reock scale. This is because the maximum distance between any two points on the perimeter of

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[5] Approximately 0.22 on the Reock scale.

[6] Young (1988)

District 17 is smaller than the maximum distance between any two points on the perimeter of District 2, producing a slightly smaller bounding circle[7]. The Reock minimum bounding circle, in this case, does not capture the fact that the shape of District 17 is at least as unusual as District 2.

Finally, it is crucial to note that minimum bounding circles are purely an abstraction that do not and logically cannot correspond to real districts within any state. Indeed, a statewide legislative district map comprised of perfectly compact, circular districts with high Reock scores would necessarily violate the principle of contiguous, non-overlapping districts. After all, a set of circles cannot tile a plane. That is, if you try to tile the state (or your kitchen floor) with circular shapes, you will left with large gaps between the circles.

Figure 2: Map of District 1 in HB 5005

[7] The diameter of the minimum bounding circle enclosing District 2 is approximately 38,999 miles, while the diameter of the bounding circle for District 17 is approximately 31,181 miles

In fact, the only way the Reock measure could be relevant to Virginia is if voters were legally permitted to cast ballots in multiple House of Delegates districts in the same election. This is because the only way to have perfectly compact districts by the Roeck measure would be for them to be circles. The only way to avoid gaps, which would disenfranchise the voters living in these unincorporated areas, would be for the circular districts to overlap.

Figure 3: Map of Districts 2 (Left) and 17 (Right) in HB 5005

The image on the bottom of Figure 4 represents the state of Virginia with the HB 5005 district boundaries outlined in grey. The image on the top represents the ideally compact minimum bounding circles around each district. While these may be useful for some theoretical purposes, in practice they produce illegal districts that both overlap and escape state boundaries. Thus satisfying the Roeck measure is impossible: No set of circular districts can produce a contiguous, non-overlapping district map without leaving territory that fell outside of the districts or used territory from outside of the state.

Thus, a better strategy is to use a measure that respects the geometry of each district, rather than comparing each district to a theoretically ideal shape. Below, I detail and implement an approach that relies exclusively on the actual shape of each state legislative district under both the Benchmark and HB 5005 maps.

2.2. *Alternative Measures of Compactness*

I now introduce a more appropriate measure of compactness, one that fits better with the geographic nature of the state of Virginia.

Instead of measuring the compactness of a district by encasing it in some idealized shape, a circle in the case of Reock measure discussed above, an alternative approach is based on examining the distribution of voters within the district. These are referred to as "moment-of-inertia" measures in literature.[8] Moment-of-inertia measures describe the spread of each voter in a district from its own "center of gravity". Intuitively, the "center of gravity" is the point in the district that minimizes the total distance from every home in district to this point. In particular, the alternative measure that I use to evaluate the Virginia House of Delegate maps is the Boyce-Clark measure.[9]

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[8] see Niemi et al. (1990)

[9] Boyce and Clark (1964)

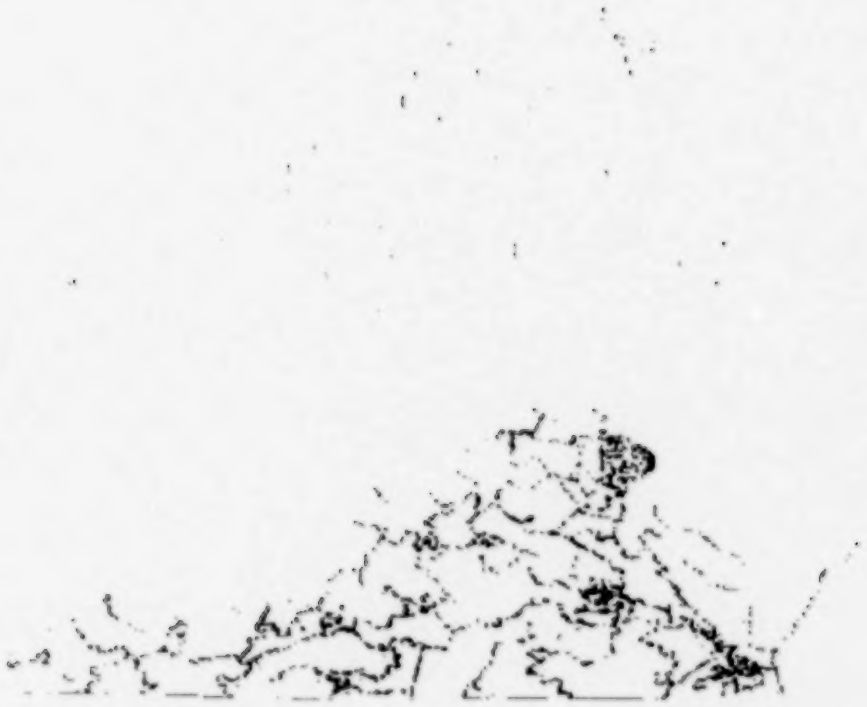

Figure 4: Minimum Bounding Circles for all of Virginia under HB 5005

The Boyce-Clark measure of compactness is based on the mean distance from each district's center of gravity to the points on its perimeter. This measure is well-documented and widely used in the academic literature, with 178 citations (relative to 60 for Earnest C. Reock's original article documenting his minimum bounding circle measure). I calculate an improved Boyce-Clark measure using the following steps:

1. Determine the center of gravity for each district under the Benchmark Map and HB 5005

2. For each district, measure the distance from its center of gravity to each of the vertices on the perimeter of the district (see Figure 5). This

represents a slight improvement to the original Boyce-Clark approach, which recommends measuring the distances from the center of each district to points on its perimeter along a set of equally spaced radial lines. Using lines to the vertices rather than equally spaced lines to the perimeter makes the measure invariant to rotation.[10] By always drawing a line from the center of the district to each vertex, I ensure that I always capture the outermost vertices of each district.

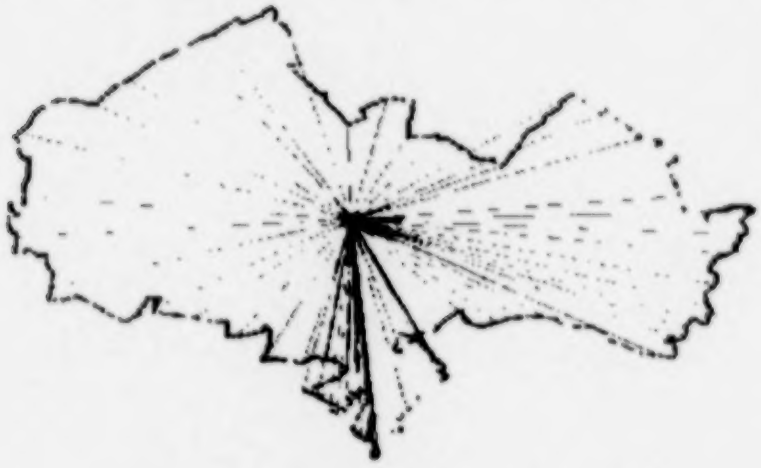

Figure 5: Average Distance from Center of Gravity to District Vertices in District 11 of the Benchmark Map

3. Calculate the average distance from each vertex in the district to its center.

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[10]Consider a district shaped like a five pointed star, but with unequally spaced points. Under one set of equally spaced radial lines, I would capture some short distances from the center to the inner walls of the star and some long distances from the center to the outer points. But rotating the radial lines slightly might lead me to capture more of the longer distances from the center to the points, and fewer of the shorter distances. This would increase my estimate of the average distance from the center to the outermost points, and it might increase my estimate of the variation from that average.

4. Calculate the absolute value of the percent difference between each center-vertex distance in the district and the average of all center-vertex distances in the district

5. For each district the modified Boyce-Clark measure represents the average of the differences between each center-vertex distance and the average for the district. This can be thought of as the average percent deviation from the mean among the distances from the center of each district to its perimeter. Since this measure is scaled as a percentage, it is bounded between 0 and 1. The most compact district, under this measure, would have a score of 0.

A summary of my findings based on the modified Boyce-Clark measure are as follows:

1. In the Benchmark Map, the Challenged Districts had an average Boyce-Clark score of 0.46 whereas in HB 5005 they show an average Boyce-Clark score of 0.44. Since a smaller value on the Boyce-Clark scale indicates greater compactness, this represents an improvement of approximately 0.02 points on the Boyce-Clark scale, or 4%.

2. In the Benchmark Map, the remaining 88 districts in the state had an average Boyce-Clark score of 0.46 whereas in HB 5005, the remaining 88 districts show an average Boyce-Clark score of 0.47. This represents a small decrease in compactness of approximately 0.01 on the Boyce-Clark scale, or 2%.

3. In the Benchmark Map, there is no appreciable difference in compactness between Challenged Districts and statewide districts. In HB 5005, compactness in the Challenged Districts is 0.03

points higher on the Boyce-Clark than it is statewide — i.e., are more compact.

4. 9 of 12 Challenged Districts saw increased in compactness in HB 5005, as did 39 of the remaining 88 districts in the state.

The complete set of findings from my compactness analysis can be found in the Appendix. A summary measure of the compactness across both the Benchmark and HB 5005 can be found in Table 2 and the results the Challenged Districts can be found in Table 3

3. DR. ANSOLABEHERE'S "ECOLOGICAL REGRESSION" ANALYSES

In order to estimate the voting behavior of African-Americans, Whites, and members of other races that vote for particular candidates, Dr. Ansolabehere uses a statistical technique called "ecological regression analysis". Ecological regression was invented more than a half century ago (Goodman, 1953). Since then, considerably better statistical procedures for ascertaining the voting preferences of minority groups have been invented and are now in widespread use throughout the academic literature and and in litigation in numerous voting rights cases. One well-documented indication of ecological regression's many failures is that it produces estimates for the share of each racial group who voted for a specific candidate that are logically impossible. In fact, this technique routinely estimates, for instance, that more than 100% of the white population within a particular district will have voted for a certain candidate. The sections that follow discuss the reasons for those results.

I replicate Dr. Ansolabehere's results in the analysis that follows, finding that many of the estimated vote

shares he estimated are indeed outside of the 0%-100% interval and therefore logically impossible. In nearly every Challenged District, his method produces an estimate outside of possible bounds for each racial group's vote share limit. This defect in his approach is not discussed in the report, which instead hides the problem by rounding results outside of possible bounds to 0 or 1 and neglects to discuss the error.

If estimates that are logically impossible are so common in his results, the ones that are logically possible, but produced by the same procedure, certainly should not be trusted. In fact, all I know about these other estimates is that they are theoretically possible (something I knew without the analysis or without any data). In other words, a method that routinely produces some estimates that anyone would know are wrong does not inspire confidence that any other estimates are correct either. Several studies with access to data with the true proportions being estimated have shown that many of those numbers tend to be wrong as well.

3.1. *Determining Vote Share By Race*

A common starting point in the process of estimating the share of each racial group voting for a specific candidate is to consider only homogeneous districts. That is, I could examine the election results from districts that are closest to racially homogeneous in character. For example, if a districts were completely racially homogeneous, say with a population that was 100% African-American, then I know what fraction of African-Americans voted for a given candidate in the district: it is just the share the given candidate got in the district. While this might be a useful starting point, as a statistical procedure, it is

problematic since it throws out most of the data unless most of the districts are homogeneous.

However, I can use the intuition from the homogeneous districts to place bounds on the level of support each group gives a candidate. Consider the following equation, which is true by definition, that relates the vote share of given candidate to the voting behavior of African-Americans and Whites:

$$V = \lambda^{B}_{i} X_i + \lambda^{W} (1 - X_i),$$

(1) where V_i is the share of the vote a given candidate received in district $_i$, X_i is the fraction of African-Americans in the district and therefore $(1 - X_i)$ is the fraction of White (or more correctly non-African-American) voters, assuming for the moment that there are only two groups in the electorate. λ^{B}_{i} is the fraction of African-Americans voting for the given candidate and similarly λ^{W}_{i} is the fraction of Whites voting for the given candidate. In other words, the equation states the fact that the total vote share for a candidate must equal the proportion of African-American voters who support them multiplied by the proportion of the electorate that is African-American plus the proportion of the White voters who support the candidate multiplied by the proportion of the electorate which is White. In the case of only two groups e.g., African-Americans and Whites and only two candidates, then racially polarized voting occurs when $\lambda^{B}_{i} \neq \lambda^{W}_{i}$. The larger the difference between support levels, the greater the level of polarization. Duncan and Davis (1953) fully developed the method of bounds outlined above to analyze ecological data.

3.2. *Ecological (or "Goodman's") Regression*

One approach to estimating λ^{B}_{i} and λ^{W}_{i}, the shares of African-American and White voters voting for a

specific candidate, is referred to in the literature as ecological regression or Goodman's regression. This is the procedure that Dr. Ansolabehere uses in his report. Like the method of bounds, it is based on the identity in Equation 1. Suppose that the fraction of support for a given candidate for both Whites and African-Americans was the same across all precincts in the district. A bit more formally, suppose that $\lambda^B_i = \lambda^B$ and $\lambda^W_i = \lambda^W$ for every precinct $_i$. Then I could estimate these fractions by choosing the best fitting line to the precinct-level data. This is just a standard linear regression, the most commonly used statistical procedure in the social sciences. From these estimates I could then compare the voting behavior between groups.

As I noted above, ecological regression can produce widely inaccurate estimates of group voting behavior.[11] First, the assumption that the fraction of group support is constant across every precinct is highly implausible. Second, ecological regression does not use the bounds information either at the district level (discussed above) nor even the overall bounds that the average fraction of a group's support for a given candidate must be between zero and one. For example, as I will see some of the elections examined here, ecological regression analysis produced negative estimates for the fraction of a group supporting a particular candidate, and estimates of more than 100% of a group supporting a particular candidate in some cases.

3.3. *Replication of Ecological Regression Results*

Dr. Ansolabehere's report presents ecological regression estimates of each Democratic candidates

[11] See King (1997).

two-party vote share among African-Americans, Whites and members of other races in his Table 13. In this section, I replicate his procedure and report these results. I do not aggregate my elections by level of jurisdiction. My replication results show a series of logically impossible vote share estimate. Rather than rounding these to their logical minimum or maximum value, as Dr. Ansolabehere did, I display these results and highlight the ones that cannot possibly represent real vote shares. Taking the 2014 U.S. House election results under the Benchmark Map as an example, my estimates show that 114%, 103%, 107%, 102%, 109%,

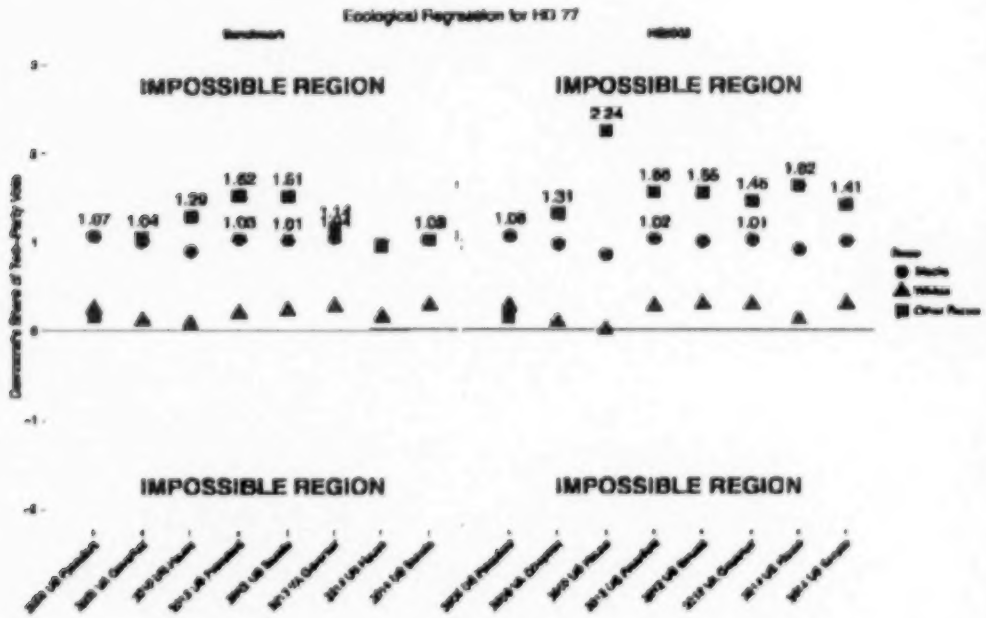


Figure 6: Ecological Regression Results, District 77

108%, 104%, and 102% of the African American vote went to the Democratic candidate in Districts 63, 69, 70, 71, 74, 80, 90, and 95, respectively.

I similarly show several cases in which the share of votes from members of other races won by the Democratic candidate is negative in multiple elections under the Benchmark Map and HB 5005. For

example, In the 2009 gubernatorial race in District 95, an ecological regression approach produces estimates indicating that the Democratic candidate won -106% of the vote among members of other races. The Democratic candidate likewise won -30% of their vote in the 2010 U.S. House election and -2% of their vote in the 2012 U.S. Senate race. (see Figure 6). Note that the Democratic candidate's share of the African-American vote in this district is over 100% in all but three elections under the Benchmark map, as well as in three elections under HB 5005.

Figure 7 provides a detailed depiction of ecological regression results for every Challenged Dis¬trict in both the Benchmark and HB 5005. A summary of the finding for these districts are:

District 63 Dr. Ansolabehere's report indicates that 100% of the African-American vote went to the Democratic candidate for governor in 2013 under HB5005. My results indicate that the true estimate from his methodology, rounded to 100% in his report, is 106%. Clearly, this is impossible. Similarly, Dr. Ansolabehere's report indicates that the average share of the African-American vote going to the Democratic candidate in federal elections under the benchmark map is 100%. In fact, my results show that the ecological regression procedure yields estimates of over 100% of the African-American vote share going to the Democratic candidate in every federal election I analysed since 2008. This is also impossible.

District 69 Dr. Ansolabehere's report indicates that 100% of the African-American vote went to the Democratic candidate for governor in 2013 under the benchmark map. My results indicate that the true estimate, rounded to 100% in his report, is 101%. This is impossible. Similarly, Dr. Ansolabehere's report

indicates that the average share of the African-American vote going to the Democratic candidate in federal elections under the benchmark map is 100%. In fact, my results show that the ecological regression procedure yields estimates of over 100% of the African-American vote share going to the Democratic candidate in my of the federal elections I analyzed since 2008. This is also impossible.

District 74 Dr. Ansolabehere's report indicates that 100% of the African-American vote went to the Democratic candidate for governor in 2013 under both the Benchmark Map and HB5005. My results indicate that the true estimates, rounded to 100% in his report, are 105% for each map. This is impossible. Similarly, Dr. Ansolabehere's report indicates that the average share of the African-American vote going to the Democratic candidate in federal elections under both the Benchmark Map and HB5005 is 100%. In fact, my results show that the ecological regression procedure yields estimates of over 100% of the African-American vote share going to the Democratic candidate in every federal election I analyzed since 2008 under the Benchmark Map. This is also impossible.

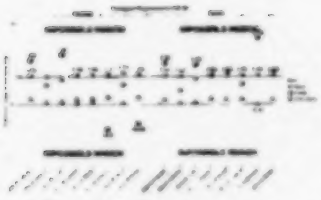
District 77 Dr. Ansolabehere's report indicates that 100% of the African-American vote went to the Democratic candidate for governor in 2013 under both the Benchmark Map and HB5005. My results indicate that the true estimates, rounded to 100% in his report, are 104% and 101% for the Benchmark Map and HB5005, respectively. This is impossible.

District 89 Dr. Ansolabehere's report inidicates that 100% of the African-American vote went to the Democratic candidate for governor in 2013 under both the Benchmark Map and HB5005. My results indicate that the true estimates, rounded to 100% in his report,

are 103% and 100% for the Benchmark Map and HB5005, respectively. The first result is impossible. Similarly, Dr. Ansolabehere's report indicates that the average share of the African-American vote going to the Democratic candidate in federal elections under both the Benchmark Map and HB5005 is 100%. In fact, my results show that the ecological regression procedure yields estimates of over 100% of the African-American vote share going to the Democratic candidate in all but one federal election I analyzed since 2008 under the Benchmark Map. This is also impossible.

District 90 Dr. Ansolabehere's report indicates that 100% of the African-American vote went to the Democratic candidate for governor in 2013 under the Benchmark Map. My results indicate that the true estimate, rounded to 100% in his report, is 103%. This is impossible. Similarly, Dr.Ansolabehere's report indicates that the average share of the African-American vote going to the Democratic candidate in federal elections under the Benchmark Map is 100%. In fact, my results show that the ecological regression procedure yields estimates of over 100% of the African-American vote share going to the Democratic candidate in all but one federal election I analyzed since 2008 under the Benchmark Map. This is also impossible.

District 92 Dr. Ansolabehere's report indicates that the average share of the African-American vote going to the Democratic candidate in federal elections under the Benchmark Map and HB5005 is 100%. In fact, my results show that the ecological regression procedure yields estimates of over 100% of the African-American vote share going to the Democratic candidate several federal elections under the Benchmark Map and HB5005. This is impossible.



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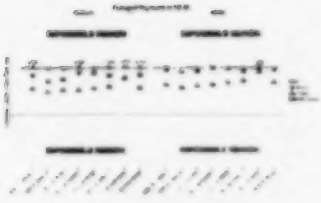

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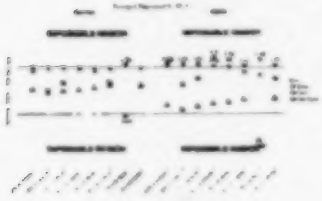

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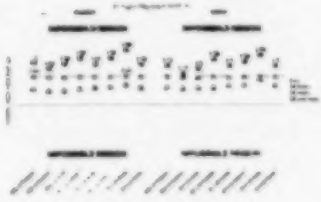

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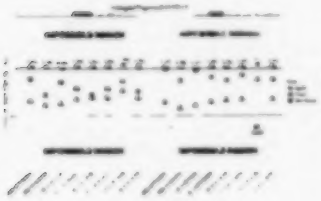
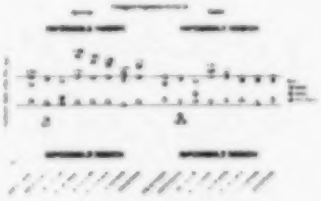
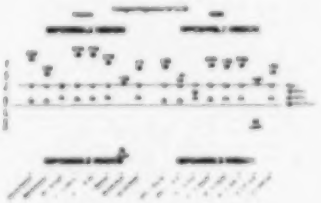


(e) District 74



(f) District 75

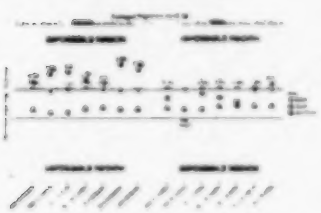
(g) District 77



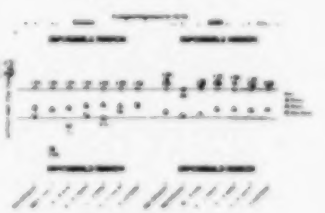
(h) District 80

(i) District 89

(j) District 90



(k) District 99



(l) District 95

District 95 Dr. Ansolabehere's report indicates that 100% of the African-American vote went to the Democratic candidate for governor in 2013 under the Benchmark Map and HB5005. My results indicate that the true estimates, rounded to 100% in his report, are 102% and 101% for the Benchmark Map and HB5005, respectively. This is impossible. Similarly, Dr. Ansolabehere's report indicates that the average share of the African-American vote going to the Democratic candidate in federal elections under the Benchmark Map is 100%. In fact, my results show that the ecological regression procedure yields estimates of over 100% of the African-American vote share going to the Democratic candidate in every federal election I analyzed since 2008 under the Benchmark Map. This is also impossible.

4. RACIAL POLARIZATION

Central to the question of whether or not increasing the African-American voting eligible population was warranted in the Challenged Districts is an examination of whether or not African-Americans had the ability to elect the candidate of their choice prior to the redrawing of the district map. Undertaking that examination presents the same challenge that Dr. Ansolabehere addressed using ecological regression. That is, I must first estimate the share of African-Americans, Whites and members of other races voting for particular candidates and address the degree of apparent polarization between groups. I do this using ecological inference (EI)[12], a technique that is bounded by both overall turnout and the real shares of district population belonging to each racial group. Unlike ecological regression, ecological inference does

[12] King (1997)

not produce impossible results and it uses considerably more information available in the data. A summary of the methodology, along with a discussion of its results, appear below.

4.1. *Ecological Inference*

EI combines information from Duncan and Davis (1953) method of bounds with a statistical model to estimate average support for a particular candidate among members of different racial groups throughout a district. The advantage of EI is that it uses information from all districts and allows a comparison of results between districts. Since EI is constrained by the deterministic bounds calculated in Duncan and Davis (1953) approach, estimates obtained through EI inference never indicate impossible vote shares.

To assess the extent of racial polarization in the Challenged Districts, I run ecological inference on general elections for seats in the Virginia House of Delegates in 2007, 2009, 2011, and 2013. Elections for seats in the Virginia House of Delegates are the only ones relevant to the question of racial polarization for several reasons. Governments across the country are becoming increasingly divided and it cannot be assumed that votes for an executive or statewide office are identical to votes in a legislative election.

In some situations, is may be possible to use one to help predict the other, but the issue at hand is only about the Virginia House of Delegates, and so if other election data are to used, their relationship to election results from the Virginia House of Delegates elections must be demonstrated first. Dr. Ansolabehere offered no evidence of any connection between his analysis of Presidential, Congressional, and Gubernatorial elections and the those for House of Delegates. For one

simple example, rates of uncontested elections in Virginia are quite high, but there exists no "uncontested distict" results for Federal or statewide elections in Dr. Ansolabehere's data.

Thus, instead, I focus on elections at the level of government for that are central to the case, the Virginia House of Delegates.

One clear indication of racial polarization is the relative willingness of African-American and White voters, respectively, to vote for African-American candidates. Several studies have shown that, White voters are less likely to support African-American officeholders. [13] Thus if racial polarization exists in a district, we would expect to see lower levels of White vote share going to African-American candidates. Dr. Ansolabehere's report does not examine the extent to which White voters in the Challenged Districts are willing to support African-American candidates for legislative office, and the answer to this question is central to racial polarization.

To examine this question, I estimate the voting behavior of the various ethnic groups using EI in competitive elections for seats in Challenged Districts of the Virginia House of Delegates in which an African-American Democrat ran against a White non-Democrat. I compare my results to estimates for competitive elections for seats in the Virginia House of Delegates in which a White Democrat ran against a White non-Democrat. Figure 8 graphically presents the estimates.

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[13] see, for example, Gay (2001).

Figure 8: EI estimates of voting behavior in contested Challenged Districts in the Virginia House of Delegates elections.

The complete results with associate measures of statistical uncertainty[14] are given in the Table 4 of the Appendix. In fact, I find that African-American Democrats running against White non-Democrats receive, on average, 91% of the African-American vote and 52% of the White vote. By contrast, White Democratic candidates running against White non-Democrats receive, on average, 94% of the African-American vote and 65% of the White vote. As importantly, the average percentage of Whites who vote for a Democrat decreases by 13 percentage points when the Democratic candidate is African-American compared to when they are White. The lower levels of White vote share won by African-American candidates indicates the presence of racial polarization. The reluctance of White voters to support African-American candidates implies that higher levels of African-American voters in the Challenged Districts appears necessary to ensure greater descriptive

[14]Formally the 95% confidence intervals.

representation for African-Americans in the Virginia House of Delegates.

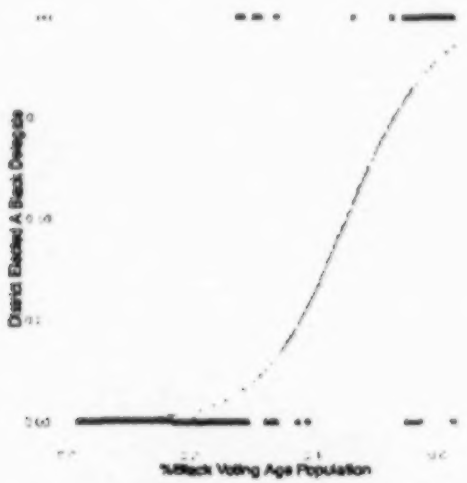

Figure 9: Probability of Electing an African-American State Legislator at Various Levels of African-American Voting Age Population

4.2. *Evaluating the Claim of Racial Packing of Districts*

One of the central claims in Dr. Ansolabehere's report is that Black voting age population in the Challenged Districts increased more than necessary under the map in HB 5005. I evaluate this claim by examining the likelihood of electing an African-American candidate to the Virginia House of Delegates in districts with varying levels of African-American voting age population. I do this by estimating a logistic regression in which the response variable is a binary indicator of whether or not the winner of each general election for a seat in the Virginia House of Delegates was an African-American, and the explanatory variable is the African-American voting age population in the district. Figure 9 summarizes the results. If raising the African-American voting age population to a level of 55% represents a case of excessive racial packing, then

probability of electing an African-American candidate in a district with 55% African-American voting age population should be at or near 100%. In fact, the probability of electing an African-American to the Virginia House of Delegates in a district with an African-American voting age population of 55% is approximately 80%, which means African-American candidates will lose one out of every five elections in these "packed" majority-minority districts. Since there is a significant gap between this result and a guaranteed win for each African-American running in these districts, it is difficult to argue that these districts have been packed.

4.3. *Effect of Race and Party on Likelihood of Inclusion of VTDs in 12 Challenged Districts*

Another claim in Dr. Ansolabehere's report is that the racial composition is a stronger predictor than Democratic vote share of the inclusion of a particular VTDs into one of the 12 Challenged Districts. Dr. Ansolabehere's claim is based on a regression analysis he conducted that shows that the effect of the Black percentage of the voting age population (BVAP) has a 7 to 13 times larger effect on the likelihood of VTD be included into a challenged district than the average Democratic vote share (see point 127 and Table 11 in his report). Unfortunately, I show that this regression is fundamentally misspecified and thus the key conclusions are likely incorrect.

In Dr. Ansolabehere's analysis, he neglects to adjust for the fact that precincts near the baseline districts are more likely to be included by the legislature in order to keep the districts compact and contiguous. That is, the legislature is not free to arbitrarily choose any given VTD to be in a particular district since this could result in non-compact and non-contiguous

district. In other words, his specifications assume that VTDs that are very far away from any Challenged District are equally likely to be included in a district as those that border it.

I thus include each VTD's geographic distance to each of the 12 Challenged Districts (as mea¬sured by centroid distance) under the Benchmark map as one of the control variables. Dr. An¬solabehere fails to include any similar control. I also control for whether a VTD was previously in a Challenged District under the benchmark map. I present the results from two separate specifica¬tions of this analysis:

1. A linear probability model that simultaneously controls for the Black voting age population and Democratic vote share

2. Two separate linear probability models where the first uses Black voting age population only and the second the Democratic vote share only.

In the first model (which is as similar as possible to Dr. Ansolabehere's original model after fixing the geographical constraint problem above), the interpretation of the coefficient on Black voting age population is the effect of increasing Black voting age population on the probability for inclusion holding Democratic vote share constant. This specification attempts to compare VTDs with the same level of Democratic vote share.

However, if BVAP and Democratic vote share are related such that one automatically increases as a result of the other, then a comparison holding one variable constant, as he does, does not make much sense since one variable cannot change without changing the other. Thus, we include the second specification that does not assume the effect of one

holding the other constant. In the two models in the second specification, I attempt to capture just the effect of BVAP and Democratic vote share separately. The two specifications are simply different ways of approaching the problem with two different sets of assumptions.

Table 1 shows the results of the two specifications. In the first specification, after properly controlling for distance from the 12 Challenged Districts, the difference between the effect of BVAP and average Democratic vote is small (0.021) and not statistically significant (the standard error of the difference is 0.063). The difference is nowhere near the magnitude in Dr. Ansolabehere's biased regression. In the second specification, separately estimating the effect of BVAP and average Democratic vote shows that the average Democratic vote actually has a slightly higher coefficient than BVAP.

Table 1: **Party and Race as Predictors of the likelihood of inclusion of VTDs in one of 12 Challenged Districts, Regression estimates (linear probability model)**

	Specification 1	Specification 2	
BVAP	0.157 (0.033)	0.249 (0.022)	0.256 (0.024)
Average Democratic Vote	0.136 (0.035)		
Control for VTD in Challenged District Under Benchmark	Yes	Yes	Yes

Control for Distance from 12 Benchmark Challenged Districts	Yes	Yes	Yes

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APPENDIX

Data Sources

1. VTD-level 2010 Census data, which was used to create the Centroid distance data set, was obtained from the Harvard Election Data Archive at

http://thedata.harvard.edu/dvn/dv/eda/faces/study/StudyPage.xhtml?globalId=hdl:1902.1/15551&studyListingIndex=1_6914dbd8a0d4058ef169639c3805

2. A crosswalk between the Benchmark and HB5005 maps at the VTD level was obtained from the Missouri Census Data Center at http://mcdc.missouri.edu/websas/geocorr12.html

3. Election results data was obtained from the Virginia Department of Elections (http://elections.virginia.gov/index.php/resultsreports/election-results/) with a direct link to the datasets at https://voterinfo.sbe.virginia.gov/SBE_CSV/ELECTIONS/ELECTIONRESULTS/

Table 2: **Modified Boyce-Clark Compactness Measures**

	Benchmark Map	HB5005	Difference
Average Compactness, Challenged Districts	0.464	0.439	-0.025
Most Compact District, Challenged Districts	0.364	0.308	-0.056
Least Compact District, Challenged Districts	0.522	0.503	-0.019
Districts Less Compact After HB5005, Challenged Districts	-	3	-
Average Compactness, Remaining Districts	0.46	0.471	0.011
Most Compact District, Remaining Districts	0.239	0.217	-0.022
Least Compact District, Remaining Districts	0.606	0.632	0.027
Districts Less Compact After HB 5005, Remaining Districts	-	49	-

Table 3: Modified Boyce-Clark Compactness Measures for Challenged Districts

District	Bench-mark Map	HB5005	Differ-ence	Percent Change
63	0.364	0.371	0.007	0.019
69	0.422	0.423	0.001	0.002
70	0.434	0.432	-0.002	-0.005
71	0.438	0.425	-0.014	-0.031
74	0.464	0.382	-0.082	-0.176
75	0.379	0.477	0.098	0.259
77	0.496	0.468	-0.028	-0.057
80	0.511	0.491	-0.020	-0.038
89	0.512	0.489	-0.022	-0.044
90	0.506	0.308	-0.198	-0.391
92	0.521	0.499	-0.022	-0.042
95	0.522	0.503	-0.019	-0.036
Challenged Districts	0.464	0.439	-0.025	-0.045
Remaining Districts	0.460	0.471	0.011	0.024
Average Differences	0.004	-0.032	-0.036	-0.069

EI Results

Table 4: Ecological Inference Estimates and 95% Confidence Interval

Democrat	Opponent	Year	District	Voter Race	Estimate	2.5%	97.5%
Black	White	2009	71	Blacks	0.941	0.899	0.966
Black	White	2009	71	Other Races	0.662	0.516	0.872
Black	White	2009	71	Whites	0.721	0.696	0.761
Black	White	2009	80	Blacks	0.907	0.885	0.929
Black	White	2009	80	Other Races	0.579	0.425	0.678
Black	White	2009	80	Whites	0.358	0.309	0.397
Black	White	2009	90	Blacks	0.908	0.870	0.943
Black	White	2009	90	Other	0.662	0.547	0.764
Black	White	2009	90	Whites	0.353	0.301	0.413
Black	White	2011	75	Blacks	0.883	0.854	0.915
Black	White	2011	75	Other	0.579	0.458	0.731
Black	White	2011	75	Whites	0.414	0.371	0.451
Black	White	2011	95	Blacks	0.918	0.808	0.983
Black	White	2011	95	Other Races	0.582	0.488	0.686
Black	White	2011	95	Whites	0.569	0.472	0.697
Black	White	2013	71	Blacks	0.975	0.949	0.992
Black	White	2013	71	Other	0.730	0.400	0.951
Black	White	2013	71	Whites	0.771	0.705	0.838
Black	White	2013	75	Blacks	0.883	0.835	0.914
Black	White	2013	75	Other	0.466	0.381	0.567
Black	White	2013	75	Whites	0.348	0.309	0.408
Black	White	2013	95	Blacks	0.890	0.834	0.925
Black	White	2013	95	Other	0.562	0.413	0.792
Black	White	2013	95	Whites	0.627	0.562	0.666
White	White	2007	69	Blacks	0.929	0.864	0.969

White	White	2007	69	Other Races	0.862	0.791	0.934
White	White	2007	69	Whites	0.675	0.598	0.780
White	White	2009	74	Blacks	0.931	0.894	0.957
White	White	2009	74	Other Races	0.679	0.492	0.773
White	White	2009	74	Whites	0.552	0.504	0.627
White	White	2013	69	Blacks	0.973	0.940	0.992
White	White	2013	69	Other Races	0.748	0.613	0.838
White	White	2013	69	Whites	0.731	0.666	0.825

Curriculum Vitae

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Education

Ph.D. University of California, San Diego. Political Science, June 1995.

M.A. University of California, San Diego. Political Science, June 1992.

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Administrative Appointments

Chair, Division of the Humanities and Social Sciences, California Institute of Technology August 2007 – June 2014.

Director, Ronald and Maxine Linde Institute of Economic and Management Sciences, California Institute of Technology

January 2013 – March 2014.

Executive Officer for the Social Sciences, California Institute of Technology, January 2007 – July 2007.

Co-director, Caltech/MIT Voting Technology Project, October 2005 – September 2010.

Director of Graduate Studies, Division of the Humanities and Social Sciences, California Institute of Technology,

July 2001 – December 2006.

Academic Appointments

Kay Sugahara Professor of Social Sciences and Statistics, California Institute of Technology, January 2012 – Present.

Professor of Social Sciences and Statistics, California Institute of Technology, June 2009 – December 2011.

Professor of Political Science, California Institute of Technology, November 2003 – May, 2009.

Gastprofessur in der Rechts-, Wirtschafts- und Verwaltungswissenschaftlichen Sektion, Universität Konstanz, April 2003 – July 2003.

Associate Professor of Political Science, California Institute of Technology, April 1998 – August 1998 and July 2000 – October 2003.

Assistant Professor of Political Science, University of Chicago, September 1998 – June 2000.

Assistant Professor of Political Science, California Institute of Technology, July 1995 – March 1998.

Post-Doctoral Fellow in Positive Political Economy, Harvard University, July 1994 – June 1995.

Honors and Awards

Elected Fellow of the American Academy of Arts and Sciences, 2011.

Elected Inaugural Fellow of the Society for Political Methodology, 2008.

Center for the Advanced Study in the Behavioral Sciences Fellowship, 2005–2006.

John M. Olin Foundation Faculty Fellow, 1999–2000.

Pi Sigma Alpha award for Best Paper Presented at the 1998 Midwest Political Science Association Meetings.

CQ Press Award for Best Paper in Legislative Politics Presented at the 1996 Annual Meeting of the American Political Science Association.

National Science Foundation Graduate Research Fellow, 1991–1994.

Brooke/Cole Award for Best Graduate Student Paper Presented at the 1993 Midwest Political Science Association Meetings.

University of California Regents Fellow, 1990–1991.

Publications

Books

Elbridge Gerry's Salamander: The Electoral Consequences of the Reapportionment Revolution. (with G. Cox). New York: Cambridge University Press. 2002.

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Strategic Entry in U.S. House Elections (with G. Cox)

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Grants

John Randolph Haynes and Dora Haynes Foundation Faculty Fellowship, 2005–2006.

National Science Foundation Grant (SES-0213549), Co-Principal investigator, Project title: " Modeling

Issues with Time-Series–Cross-Section Data" , 2002-2004.

DAAD (German Academic Exchange Service) Learn German in Germany fellowship, Summer, 1998.

National Science Foundation Grant (SBR-9729899), Co-Principal investigator, Project title: " Strategic Redistricting and Its Political Consequences", 1998–1999.

IBM University Equipment Grants Program, . Co-principal investigator. Project title: "Individuals and Aggregates: New Computational Techniques for Testing Models of Politics", 1996–1997.

John Randolph Haynes and Dora Haynes Foundation Faculty Fellowship, 1996–1997.

Editorial Board Service

Co-Editor, Political Analysis January 2010 – Present.

Member, Editorial Board of Political Research Quarterly June, 2000 – Present.

Member, Editorial Board of Electoral Studies January, 2002 – Present.

Member, Editorial Board of American Journal of Political Science, January 2006 – January, 2010.

Member, Editorial Board of Political Analysis July, 2001 – December 2009.

Other Professional Activities

Member of the Scientific Advisory Board, Global Consequences Inc., October, 2014 – Present.

Guest Manuscript Editor, Proceedings of the National Academy of Sciences, January 2014.

Member, Advisory Board of Daegu Gyeongbuk Institute of Science and Technology (Republic of Korea), August 2012 – Present.

Member, University Advisory Council of the Pohang University of Science and Technology (Republic of Korea), October 2008 – Present.

Founding Co-editor, Political Science Network (PSN), January 2007 – Present. Member, Caltech/MIT Voting Technology Project, October, 2003- Present.

Member, Expert Panel on Measles Mortality Estimates, World Health Organization, 2004

Treasurer, Political Methodology Section of the American Political Science Association. August 2003 – September 2008.

Section Organizer and Member of the Program Committee for 2004 Annual Meeting of the American Political Science Association.

Member, Steering Committee of the USC-Caltech Center for the Study of Law & Politics, July 2000 – Present.

Member of Program Committee for Fourteenth Summer Political Methodology Conference.

Instructor, ICPSR Summer Program in Quantitative Methods, University of Michigan, 1994 and 1995.

February 13, 2015

ADOPTED
April 3, 2001

HOUSE COMMITTEE ON PRIVILEGES AND ELECTIONS COMMITTEE RESOLUTION NO. 1

RESOLVED, That after consideration of legal requirements and public policy objectives, informed by public comment, the House Committee on Privileges and Elections adopts the following criteria for the redrawing of Virginia's House of Delegates districts:

I. Population Equality

The population of legislative districts shall be determined solely according to the enumeration established by the 2000 federal census. The population of each district shall be as nearly equal to the population of every other district as practicable. Population deviations in House of Delegates districts should be within plus-or-minus two percent.

II. Voting Rights Act

Districts shall be drawn in accordance with the laws of the United States and the Commonwealth of Virginia including compliance with protections against the unwarranted retrogression or dilution of racial or ethnic minority voting strength. Nothing in these guidelines shall be construed to require or permit any districting policy or action that is contrary to the United States Constitution or the Voting Rights Act of 1965.

III. Contiguity and Compactness

Districts shall be comprised of contiguous territory including adjoining insular territory. Contiguity by water is sufficient. Districts shall be contiguous and

compact in accordance with the Constitution of Virginia as interpreted by the Virginia Supreme Court in the recent case of *Jamerson v. Womack*, 244 Va. 506 (1992).

IV. Single- Member Districts

All districts shall be single-member districts.

V. Communities of Interest

Districts shall be based on legislative consideration of the varied factors that can create or contribute to communities of interest. These factors may include, among others, economic factors, social factors, cultural factors, geographic features, governmental jurisdictions and service delivery areas, political beliefs, voting trends, and incumbency considerations. Public comment has been invited, has been and continues to be received, and will be considered. It is inevitable that some interests will be advanced more than others by the choice of particular district configurations. The discernment, weighing, and balancing of the varied factors that contribute to communities of interest is an intensely political process best carried out by elected representatives of the people. Local government jurisdiction and precinct lines may reflect communities of interest to be balanced, but they are entitled to no greater weight as a matter of state policy than other identifiable communities of interest.

VI. Priority

All of the foregoing criteria shall be considered in the districting process, but population equality among districts and compliance with federal and state constitutional requirements and the Voting Rights Act of 1965 shall be given priority in the

event of conflict among the criteria. Where the application of any of the foregoing criteria may cause a violation of applicable federal or state law, there may be such deviation from the criteria as is necessary, but no more than is necessary, to avoid such violation.

U.S. Census Bureau News

US. Department of Commerce
Washington, D.C. 20233

FOR IMMEDIATE RELEASE: THURSDAY, FEB. 3, 2011

U.S. Census Bureau Delivers Virginia's 2010 Census Population Totals, Including First Look at Race and Hispanic Origin Data for Legislative Redistricting

CB11-CN.16

Contact:
Public Information Office
301-763-3030

Custom tables [Excel]
Map: Population totals [PDF]
Map: Population change [PDF]
FTP site
Press kit
American FactFinder

The U.S. Census Bureau today released more detailed 2010 Census population totals and demographic characteristics to state leaders in Virginia. These data provide the first look at population counts for small areas and race, Hispanic origin, voting age and housing unit data released from the 2010 Census.

The official 2010 Census Redistricting Data Summary File can be used to redraw federal, state and local legislative districts under Public Law 94-171. The census data are used by state officials to realign congressional and state legislative districts in their states, taking into account population shifts since the 2000 Census.

Data for Virginia show that the five most populous incorporated places and their 2010 Census counts are Virginia Beach, 437,994; Norfolk, 242,803; Chesapeake, 222,209; Richmond, 204,214; and Newport News, 180,719. Virginia Beach grew by 3.0 percent since the 2000 Census. Norfolk grew by 3.6 percent, Chesapeake grew by 11.6 percent, Richmond grew by 3.2 percent and Newport News grew by 0.3 percent.

The largest county is Fairfax with a population of 1,081,726. Its population grew by 11.5 percent since 2000. The other counties in the top five include Prince William, with a population of 402,002 (increase of 43.2 percent); Chesterfield. population of 316,236 (increase of 21.7 percent); Loudoun, population of 312,311 (increase of 84.1 percent); and Henrico, population of 306,935 (increase of 17.0 percent).

The redistricting file consists of five detailed tables: the first shows the population by race, including six single race groups and 57 multiple race groups (63 total race categories); the second shows the Hispanic or Latino population as well as the non-Hispanic or Latino population cross-tabulated by the 63 race categories_ These tabulations are repeated in the third and fourth tables for the population 18 years and over and are for the resident population of the United States. The fifth table provides counts of housing units and their occupancy status.

These five detailed tables are available to the public online via FTP download at http: //www2.census.gov/census_2010/01-Redistricting_File—PL_94-171 and will be available within 24 hours at http://factfinder2.census.gov. (Special instructions for linking data downloaded from FactFinder with the

Census Bureau's geographic products can be found at https://www.census.gov/rdo/tech_tips.)

By April 1, all 50 states, the District of Columbia and Puerto Rico will receive these data for the following areas: state, congressional districts (for 111th Congress), counties, minor civil divisions, state legislative districts, places, school districts, census tracts, block groups and blocks, and if applicable, American Indian and Alaska Native areas and Hawaiian home lands. In addition, data are available for the 46 states that voluntarily provided voting districts to the Census Bureau's Redistricting Data Program. Unique geographies for the Commonwealth of Puerto Rico are also available.

Race and Hispanic Origin Data

The Census Bureau collects race and Hispanic origin information following the U.S. Office of Management and Budget's (OMB) standards for collecting and tabulating data on race and ethnicity. In October 1997, the OMB issued the current standards, which identify five race groups: white, black or African-American, American Indian or Alaska Native, Asian, and Native Hawaiian or Other Pacific Islander. The Census Bureau also utilized a sixth category – "some other race." Respondents who reported only one race are shown in these six groups.

Individuals were first presented with the option to self-identify with more than one race in the 2000 Census, and this continued in the 2010 Census. People who identify with more than one race may choose to provide multiple races in response to the race question. The 2010 Census results provide new data on the size and makeup of the nation's multiracial population.

Respondents who reported more than one of the six race groups are included in the "two or more races" population. There are 57 possible combinations of the six race groups.

The Census Bureau included the "some other race" category for responses that could not be classified in any of the other race categories on the questionnaire. In the 2000 Census, the vast majority of people who reported only as "some other race" were of Hispanic or Latino origin. Data on Hispanics or Latinos, who may be of any race, were obtained from a separate question on ethnicity.

How to Find Assistance

Additional information about the redistricting data program, including news releases for other states, can be found online at https://www.census.Gov/2010census/news/press-kits/redistricting.html. More information on the redistricting data program is also available at https://www.census.gov/rdo/data.

For further information about Virginia's 2010 Census redistricting data, contact:

- Census Redistricting Data Office,
  U.S. Census Bureau, 301-763-4039;
  e-mail: rdo@census.gov;
- Census Bureau Regional Office, Charlotte,
  704-424-6430;
  e-mail: Charlotte.Regional.Office@census.gov;
- State Data Centers
  https://www.census.gov/sdc/network.html

Description of Five Custom Tables

In addition to the full set of detailed tables to be available on FactFinder within 24 hours, five custom tables are also attached to this news release. The first (Table 1) shows the most populous counties and incorporated places in 2010, their change since the 2000 Census, and their population rank for both decades.

Table 2 shows data for all ages and for those 18 and older for the Hispanic or Latino population, as well as for people who reported one race and those who reported two or more races. This table also shows the numeric and percent change in the population by race and Hispanic origin between 2000 and 2010.

Table 3 is similar to Table 2. However, it shows data for the six "race alone or in combination" categories. The concept "race alone or in combination" includes people who reported only a single race (e.g., Asian) and people who reported that race in combination with one or more of the other major race groups (i.e., white, black or African-American, American Indian and Alaska Native, Native Hawaiian and Other Pacific Islander, and some other race).

The concept "race alone or in combination," represents the maximum number of people who reported as that major race group, either alone or in combination with another race(s). The sum of the six individual "race alone or in combination" categories may add to more than the total population because people who reported more than one race were tallied in each race category.

For people who reported two or more races, Table 4 shows the population in each of the 15 combinations of two races (for example, the number of people who

reported being both white and black or African-American).

Table 5 shows the population in the major race categories and of Hispanic or Latino origin for Virginia's most populous counties and incorporated places.

Description of Two Custom Maps

The attached custom maps show the total population by county for Virginia and the percent change in the population by county.

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Editor's Note: The five detailed tables provided to the state are available to the public online via FTP at http://www2.census.gov/census_2010/01-Redistricting File—PL 94-171/ download and will be available within 24 hours at http://factfinder2.census.gov. Special instructions for linking data downloaded from FactFinder with the Census Bureau's geographic products can be found at https:// www.census.gov/rdo/tech_tips.

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https://www.census.gov/2010census/news/releases/operations/cb111-cn16.html

Current House Districts
District Population Summary

DISTRICT	Total Population	Target	Difference	Deviation from Ideal
1	72,324	80,010	-7,686	-9.6%
2	69,063	80,010	-10,947	-13.7%
3	66,212	80,010	-13,798	-17.2%
4	73,375	80,010	-6,635	-8.3%
5	69,572	80,010	-10,438	-13.0%
6	73,250	80,010	-6,760	-8.4%
7	75,999	80,010	-4,011	-5.0%
8	74,460	80,010	-5,550	-6.9%
9	82,064	80,010	2,054	2.6%
10	68,822	80,010	-11,188	-14.0%
11	73,038	80,010	-6,972	-8.7%
12	75,683	80,010	-4,327	-5.4%
13	190,620	80,010	110,610	138.2%
14	64,712	80,010	-15,298	-19.1%
15	78,102	80,010	-1,908	-2.4%
16	70,220	80,010	-9,790	-12.2%
17	73,149	80,010	-6,861	-8.6%
18	82,817	80,010	2,807	3.5%
19	78,345	80,010	-1,665	-2.1%
20	76,800	80,010	-3,210	-4.0%
21	76,066	80,010	-3,944	-4.9%
22	78,106	80,010	-1,904	-2.4%
23	80,898	80,010	888	1.1%
24	72,372	80,010	-7,638	-9.5%
25	83,601	80,010	3,591	4.5%
26	82,704	80,010	2,694	3.4%
27	87,915	80,010	7,905	9.9%
28	94,896	80,010	14,886	18.6%
29	88,049	80,010	8,039	10.0%
30	90,008	80,010	9,998	12.5%
31	88,587	80,010	8,577	10.7%
32	112,677	80,010	32,667	40.8%
33	113,100	80,010	33,090	41.4%
34	74,627	80,010	-5,383	-6.7%
35	87,326	80,010	7,316	9.1%
36	74,325	80,010	-5,685	-7.1%
37	75,246	80,010	-4,764	-6.0%
38	76,948	80,010	-3,062	-3.8%
39	78,182	80,010	-1,828	-2.3%
40	80,835	80,010	825	1.0%
41	70,634	80,010	-9,376	-11.7%
42	81,840	80,010	1,830	2.3%
43	78,088	80,010	-1,922	-2.4%
44	79,883	80,010	-127	-0.2%
45	78,709	80,010	-1,301	-1.6%
46	77,235	80,010	-2,775	-3.5%
47	78,184	80,010	-1,826	-2.3%
48	83,331	80,010	3,321	4.2%
49	68,637	80,010	-11,373	-14.2%
50	82,586	80,010	2,576	3.2%

DISTRICT	Total Population	Target	Difference	Deviation from Ideal
51	77,333	80,010	-2,677	-3.3%
52	98,234	80,010	18,224	22.8%
53	80,425	80,010	415	0.5%
54	99,135	80,010	19,125	23.9%
55	81,482	80,010	1,472	1.8%
56	95,097	80,010	15,087	18.9%
57	74,900	80,010	-5,110	-6.4%
58	87,462	80,010	7,452	9.3%
59	77,730	80,010	-2,280	-2.8%
60	72,146	80,010	-7,864	-9.8%
61	71,425	80,010	-8,585	-10.7%
62	76,461	80,010	-3,549	-4.4%
63	73,723	80,010	-6,287	-7.9%
64	83,940	80,010	3,930	4.9%
65	89,790	80,010	9,780	12.2%
66	88,542	80,010	8,532	10.7%
67	87,457	80,010	7,447	9.3%
68	73,167	80,010	-6,843	-8.6%
69	71,299	80,010	-8,711	-10.9%
70	79,380	80,010	-630	-0.8%
71	74,194	80,010	-5,816	-7.3%
72	81,778	80,010	1,768	2.2%
73	74,500	80,010	-5,510	-6.9%
74	80,153	80,010	143	0.2%
75	70,454	80,010	-9,556	-11.9%
76	92,939	80,010	12,929	16.2%
77	76,927	80,010	-3,083	-3.9%
78	81,062	80,010	1,052	1.3%
79	73,068	80,010	-6,942	-8.7%
80	70,585	80,010	-9,425	-11.8%
81	74,455	80,010	-5,555	-6.9%
82	70,417	80,010	-9,593	-12.0%
83	73,171	80,010	-6,839	-8.5%
84	77,736	80,010	-2,274	-2.8%
85	74,035	80,010	-5,975	-7.5%
86	89,028	80,010	9,018	11.3%
87	71,505	80,010	-8,505	-10.6%
88	93,126	80,010	13,116	16.4%
89	74,259	80,010	-5,751	-7.2%
90	71,080	80,010	-8,930	-11.2%
91	64,074	80,010	-15,936	-19.9%
92	71,017	80,010	-8,993	-11.2%
93	73,204	80,010	-6,806	-8.5%
94	71,464	80,010	-8,546	-10.7%
95	67,882	80,010	-12,128	-15.2%
96	90,800	80,010	10,790	13.5%
97	87,705	80,010	7,695	9.6%
98	75,266	80,010	-4,744	-5.9%
99	80,416	80,010	406	0.5%
100	71,374	80,010	-8,636	-10.8%

Current House Districts
Demographic Population Totals

DISTRICT	Total Population	White	% White	Black	% Black	AIAN	% AIAN	Asian	% Asian	HawPI	% HawPI	Other	% Other	Multi	% Multi	Hispanic	% Hispanic
1	72,324	68,697	95.0%	2,462	3.4%	417	0.6%	259	0.4%	38	0.1%	373	0.5%	78	0.1%	897	1.2%
2	69,063	66,506	96.3%	1,656	2.4%	284	0.4%	246	0.4%	5	0.0%	320	0.5%	46	0.1%	649	0.9%
3	66,212	63,801	96.4%	1,687	2.5%	257	0.4%	274	0.4%	16	0.0%	127	0.2%	50	0.1%	348	0.5%
4	73,375	69,960	95.3%	2,025	2.8%	354	0.5%	399	0.5%	28	0.0%	517	0.7%	92	0.1%	1,096	1.5%
5	69,572	66,204	95.2%	1,782	2.6%	360	0.5%	219	0.3%	16	0.0%	883	1.3%	108	0.2%	1,999	2.9%
6	73,250	68,477	93.5%	3,489	4.8%	368	0.5%	508	0.7%	18	0.0%	299	0.4%	91	0.1%	816	1.1%
7	75,999	68,874	90.6%	4,220	5.6%	410	0.5%	1,580	2.1%	43	0.1%	648	0.9%	224	0.3%	1,712	2.3%
8	74,460	66,841	89.8%	4,367	5.9%	343	0.5%	2,069	2.8%	35	0.0%	643	0.9%	162	0.2%	1,516	2.0%
9	82,064	72,357	88.2%	7,693	9.4%	438	0.5%	420	0.5%	30	0.0%	1,042	1.3%	84	0.1%	2,038	2.5%
10	68,822	57,357	83.3%	9,253	13.4%	321	0.5%	216	0.3%	16	0.0%	1,565	2.3%	94	0.1%	2,387	3.5%
11	73,036	41,641	57.0%	27,077	37.1%	388	0.5%	1,273	1.7%	45	0.1%	2,119	2.9%	495	0.7%	4,387	6.0%
12	75,683	66,051	87.3%	3,722	4.9%	362	0.5%	4,738	6.3%	58	0.1%	535	0.7%	217	0.3%	1,718	2.3%
13	190,620	124,874	65.5%	20,901	11.0%	1,316	0.7%	32,384	17.0%	226	0.1%	9,183	4.8%	1,736	0.9%	23,028	12.1%
14	64,712	36,383	56.2%	26,230	40.5%	286	0.4%	573	0.9%	15	0.0%	1,032	1.6%	193	0.3%	1,812	2.8%
15	78,102	73,483	94.1%	1,978	2.5%	474	0.6%	451	0.6%	30	0.0%	1,525	2.0%	161	0.2%	3,254	4.2%
16	70,220	50,595	72.1%	17,354	24.7%	313	0.4%	401	0.6%	28	0.0%	1,332	1.9%	197	0.3%	2,352	3.3%
17	73,148	64,912	88.7%	4,964	6.8%	414	0.6%	1,879	2.6%	52	0.1%	750	1.0%	178	0.2%	2,054	2.8%
18	82,817	73,286	88.5%	5,514	6.7%	654	0.8%	1,229	1.5%	68	0.1%	1,781	2.2%	285	0.3%	4,377	5.3%
19	78,345	71,686	91.5%	4,976	6.4%	485	0.6%	761	1.0%	23	0.0%	321	0.4%	93	0.1%	1,079	1.4%
20	76,800	69,159	90.1%	5,343	7.0%	339	0.4%	708	0.9%	31	0.0%	1,061	1.4%	159	0.2%	2,046	2.7%
21	76,066	44,120	58.0%	19,674	25.9%	559	0.7%	8,530	11.2%	160	0.2%	1,912	2.5%	1,111	1.5%	5,840	7.7%
22	78,106	66,298	84.9%	9,564	12.2%	470	0.6%	947	1.2%	33	0.0%	591	0.8%	203	0.3%	1,359	1.7%
23	80,898	52,271	64.6%	24,387	30.1%	512	0.6%	2,074	2.6%	49	0.1%	1,136	1.4%	469	0.6%	2,409	3.0%
24	72,372	63,377	87.6%	6,894	9.5%	803	1.1%	587	0.8%	54	0.1%	455	0.6%	202	0.3%	1,279	1.8%
25	83,601	75,378	90.2%	5,149	6.2%	450	0.5%	910	1.1%	31	0.0%	1,482	1.8%	201	0.2%	3,287	3.9%
26	82,704	69,835	84.4%	4,002	4.8%	526	0.6%	2,322	2.8%	78	0.1%	5,617	6.8%	324	0.4%	9,972	12.1%
27	87,915	53,835	61.2%	24,950	28.4%	672	0.8%	3,326	3.8%	91	0.1%	4,267	4.9%	774	0.9%	7,454	8.5%
28	94,896	67,409	71.0%	18,738	19.7%	875	0.9%	3,227	3.4%	114	0.1%	3,614	3.8%	919	1.0%	8,156	8.6%
29	88,049	75,005	85.2%	6,131	7.0%	572	0.6%	1,608	1.8%	49	0.1%	4,376	5.0%	308	0.3%	7,986	9.1%
30	90,008	71,208	79.1%	13,596	15.1%	687	0.8%	1,211	1.3%	88	0.1%	2,839	3.2%	379	0.4%	5,431	6.0%
31	88,587	50,876	57.4%	21,329	24.1%	980	1.1%	6,136	6.9%	166	0.2%	8,006	9.0%	1,094	1.2%	17,440	19.7%
32	112,677	78,639	69.8%	8,882	7.9%	546	0.5%	18,265	16.2%	129	0.1%	5,239	4.6%	977	0.9%	12,650	11.2%
33	113,100	91,930	81.3%	8,216	7.3%	705	0.6%	6,839	6.0%	91	0.1%	4,607	4.1%	712	0.6%	11,020	9.7%
34	74,627	56,389	75.6%	2,378	3.2%	260	0.3%	14,115	18.9%	65	0.1%	1,025	1.4%	395	0.5%	4,083	5.5%
35	87,326	61,455	70.4%	4,222	4.8%	372	0.4%	17,851	20.4%	64	0.1%	2,809	3.2%	553	0.6%	7,687	8.8%
36	74,325	53,192	71.6%	6,557	8.8%	421	0.6%	10,228	13.8%	55	0.1%	3,353	4.5%	521	0.7%	8,166	11.0%

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Current House Districts
Demographic Population Totals

DISTRICT	Total Population	White	% White	Black	% Black	AIAN	% AIAN	Asian	% Asian	HawPI	% HawPI	Other	% Other	Multi	% Multi	Hispanic	% Hispanic
37	75,246	50,420	67.0%	5,089	6.8%	501	0.7%	15,072	20.0%	84	0.1%	3,571	4.7%	509	0.7%	9,596	12.8%
38	76,948	42,145	54.8%	8,355	10.9%	633	0.8%	14,029	18.2%	84	0.1%	10,981	14.3%	721	0.9%	22,423	29.1%
39	78,182	42,855	54.8%	5,640	7.2%	602	0.8%	19,256	24.6%	98	0.1%	9,036	11.6%	695	0.9%	18,721	23.9%
40	80,835	50,362	62.3%	5,583	6.9%	385	0.5%	20,260	25.1%	116	0.1%	3,473	4.3%	656	0.8%	8,745	10.8%
41	70,634	48,861	69.2%	4,820	6.8%	376	0.5%	13,025	18.4%	89	0.1%	2,992	4.2%	471	0.7%	8,758	12.4%
42	81,840	50,066	61.2%	12,530	15.3%	506	0.6%	14,166	17.3%	179	0.2%	3,534	4.3%	859	1.0%	9,713	11.9%
43	78,088	47,719	61.1%	12,903	16.5%	516	0.7%	11,514	14.7%	106	0.1%	4,606	5.9%	724	0.9%	11,333	14.5%
44	79,883	43,977	55.1%	17,844	22.3%	618	0.8%	6,180	7.7%	107	0.1%	10,269	12.9%	888	1.1%	19,646	24.6%
45	78,709	60,868	77.3%	9,386	11.9%	507	0.6%	4,149	5.3%	94	0.1%	3,224	4.1%	481	0.6%	7,724	9.8%
46	77,235	38,614	50.0%	23,170	30.0%	456	0.6%	7,692	10.0%	113	0.1%	6,247	8.1%	943	1.2%	13,313	17.2%
47	78,184	56,589	72.4%	5,813	7.4%	739	0.9%	8,838	11.3%	90	0.1%	5,475	7.0%	640	0.8%	11,875	15.2%
48	83,331	66,164	79.4%	4,937	5.9%	449	0.5%	9,303	11.2%	107	0.1%	1,905	2.3%	468	0.6%	6,829	8.2%
49	68,637	34,706	50.6%	12,258	17.9%	863	1.3%	6,508	9.5%	109	0.2%	13,295	19.4%	898	1.3%	25,906	37.7%
50	82,586	48,105	58.2%	12,298	14.9%	759	0.9%	5,727	6.9%	145	0.2%	14,685	17.8%	867	1.0%	27,713	33.6%
51	77,333	44,042	57.0%	17,487	22.6%	848	1.1%	6,257	8.1%	143	0.2%	7,443	9.6%	1,113	1.4%	16,105	20.8%
52	98,234	48,570	49.4%	29,307	29.8%	958	1.0%	7,833	8.0%	216	0.2%	9,736	9.9%	1,614	1.6%	20,277	20.6%
53	80,425	53,510	66.5%	3,711	4.6%	527	0.7%	17,541	21.8%	58	0.1%	4,505	5.6%	573	0.7%	11,102	13.8%
54	99,135	73,991	74.6%	17,358	17.5%	752	0.8%	2,809	2.8%	181	0.2%	3,318	3.3%	726	0.7%	7,451	7.5%
55	81,482	69,898	85.8%	8,557	10.5%	571	0.7%	1,457	1.8%	42	0.1%	718	0.9%	239	0.3%	1,793	2.2%
56	95,097	73,809	77.6%	13,209	13.9%	483	0.5%	6,259	6.6%	51	0.1%	873	0.9%	413	0.4%	2,512	2.6%
57	74,900	53,060	70.8%	13,245	17.7%	452	0.6%	5,861	7.8%	51	0.1%	2,009	2.7%	422	0.6%	4,670	6.2%
58	87,462	73,991	84.6%	7,960	9.1%	520	0.6%	2,817	3.2%	55	0.1%	1,826	2.1%	293	0.3%	3,736	4.3%
59	77,730	55,777	71.8%	19,957	25.7%	457	0.6%	528	0.7%	38	0.0%	721	0.9%	252	0.3%	1,699	2.2%
60	72,146	45,053	62.4%	25,345	35.1%	375	0.5%	439	0.6%	26	0.0%	689	1.0%	219	0.3%	1,381	1.9%
61	71,425	44,755	62.7%	24,572	34.4%	467	0.7%	367	0.5%	27	0.0%	984	1.4%	253	0.4%	1,972	2.8%
62	76,461	50,920	66.6%	20,756	27.1%	708	0.9%	1,363	1.8%	158	0.2%	1,947	2.5%	609	0.8%	4,620	6.0%
63	73,723	28,027	38.0%	43,266	58.7%	363	0.5%	570	0.8%	42	0.1%	1,031	1.4%	424	0.6%	2,229	3.0%
64	83,940	60,932	72.6%	18,549	22.1%	530	0.6%	2,184	2.6%	80	0.1%	1,198	1.4%	467	0.6%	2,992	3.6%
65	89,790	76,337	85.0%	8,659	9.6%	428	0.5%	3,398	3.8%	52	0.1%	620	0.7%	296	0.3%	2,204	2.5%
66	88,542	66,178	74.7%	16,104	18.2%	628	0.7%	3,076	3.5%	94	0.1%	1,863	2.1%	599	0.7%	4,383	5.0%
67	87,457	55,307	63.2%	6,052	6.9%	415	0.5%	21,113	24.1%	147	0.2%	3,879	4.4%	544	0.6%	9,540	10.9%
68	73,167	58,903	80.5%	9,335	12.8%	430	0.6%	2,749	3.8%	43	0.1%	1,352	1.8%	355	0.5%	3,293	4.5%
69	71,299	20,800	29.2%	42,217	59.2%	437	0.6%	1,274	1.8%	83	0.1%	5,778	8.1%	710	1.0%	8,956	12.6%
70	79,380	20,552	25.9%	51,434	64.8%	619	0.8%	931	1.2%	90	0.1%	4,925	6.2%	829	1.0%	7,748	9.8%
71	74,194	31,419	42.3%	37,630	50.7%	349	0.5%	3,341	4.5%	45	0.1%	739	1.0%	671	0.9%	2,102	2.8%
72	81,778	59,935	73.3%	9,852	12.0%	372	0.5%	9,410	11.5%	44	0.1%	1,663	2.0%	502	0.6%	4,119	5.0%

Current House Districts
Demographic Population Totals

DISTRICT	Total Population	White	% White	Black	% Black	AIAN	% AIAN	Asian	% Asian	HawPI	% HawPI	Other	% Other	Multi	% Multi	Hispanic	% Hispanic
73	74,500	53,028	71.2%	13,159	17.7%	422	0.6%	4,270	5.7%	54	0.1%	3,074	4.1%	493	0.7%	5,985	8.0%
74	80,153	22,642	28.2%	52,671	65.7%	956	1.2%	1,648	2.1%	59	0.1%	1,408	1.8%	769	1.0%	2,843	3.5%
75	70,454	29,259	41.5%	39,552	56.1%	317	0.4%	304	0.4%	28	0.0%	706	1.0%	286	0.4%	1,415	2.0%
76	92,939	62,747	67.5%	25,300	27.2%	614	0.7%	2,770	3.0%	95	0.1%	806	0.9%	607	0.7%	2,782	3.0%
77	76,927	26,834	34.9%	45,907	59.7%	545	0.7%	1,426	1.9%	53	0.1%	1,443	1.9%	719	0.9%	3,463	4.5%
78	81,062	60,624	74.8%	14,167	17.5%	573	0.7%	4,166	5.1%	121	0.1%	829	1.0%	582	0.7%	3,366	4.2%
79	73,068	37,625	51.5%	31,015	42.4%	591	0.8%	2,168	3.0%	106	0.1%	806	1.1%	757	1.0%	2,677	3.7%
80	70,585	26,723	37.9%	40,704	57.7%	419	0.6%	1,217	1.7%	121	0.2%	806	1.1%	595	0.8%	2,179	3.1%
81	74,455	56,417	75.8%	12,044	16.2%	643	0.9%	3,022	4.1%	143	0.2%	1,555	2.1%	631	0.8%	4,637	6.2%
82	70,417	59,930	85.1%	6,096	8.7%	492	0.7%	2,173	3.1%	107	0.2%	1,151	1.6%	468	0.7%	3,481	4.9%
83	73,171	49,900	68.2%	15,378	21.0%	679	0.9%	4,503	6.2%	139	0.2%	1,806	2.5%	766	1.0%	4,786	6.5%
84	77,736	49,762	64.0%	17,375	22.4%	582	0.7%	6,903	8.9%	219	0.3%	1,974	2.5%	921	1.2%	5,807	7.5%
85	74,035	48,354	65.3%	16,265	22.0%	550	0.7%	6,596	8.9%	126	0.2%	1,350	1.8%	794	1.1%	4,111	5.6%
86	89,028	45,201	50.8%	8,852	9.9%	603	0.7%	21,671	24.3%	80	0.1%	11,631	13.1%	990	1.1%	21,686	24.4%
87	71,505	44,488	62.2%	19,445	27.2%	906	1.3%	3,002	4.2%	206	0.3%	2,485	3.5%	973	1.4%	6,282	8.8%
88	93,126	69,355	74.5%	14,637	15.7%	710	0.8%	3,211	3.4%	171	0.2%	4,231	4.5%	811	0.9%	9,390	10.1%
89	74,259	27,578	37.1%	41,471	55.8%	534	0.7%	2,293	3.1%	113	0.2%	1,353	1.8%	917	1.2%	3,770	5.1%
90	71,080	23,112	32.5%	42,685	60.1%	467	0.7%	2,297	3.2%	137	0.2%	1,496	2.1%	886	1.2%	3,849	5.4%
91	64,074	49,115	76.7%	10,814	16.9%	487	0.8%	2,131	3.3%	85	0.1%	942	1.5%	500	0.8%	2,558	4.0%
92	71,017	21,018	29.6%	45,541	64.1%	545	0.8%	1,592	2.2%	84	0.1%	989	1.4%	1,248	1.8%	3,228	4.5%
93	73,204	37,635	51.4%	28,983	39.9%	611	0.8%	3,343	4.6%	191	0.3%	3,308	4.5%	1,133	1.5%	7,537	10.3%
94	71,464	46,217	64.7%	19,245	26.9%	615	0.9%	2,613	3.7%	151	0.2%	1,622	2.3%	1,001	1.4%	4,757	6.7%
95	67,882	20,630	30.4%	43,539	64.1%	419	0.6%	1,218	1.8%	87	0.1%	925	1.4%	1,064	1.6%	2,616	3.9%
96	90,800	69,279	76.3%	14,143	15.6%	682	0.8%	4,444	4.9%	181	0.2%	1,315	1.4%	776	0.9%	4,001	4.4%
97	87,705	67,875	77.4%	16,379	18.7%	1,253	1.4%	956	1.1%	64	0.1%	716	0.8%	462	0.5%	2,025	2.3%
98	75,266	60,550	80.4%	12,302	16.3%	724	1.0%	715	0.9%	48	0.1%	632	0.8%	297	0.4%	1,790	2.4%
99	80,416	56,876	70.7%	20,398	25.4%	689	0.9%	764	1.0%	45	0.1%	1,291	1.6%	353	0.4%	2,976	3.7%
100	71,374	44,500	62.3%	20,837	29.2%	643	0.9%	1,540	2.2%	162	0.2%	2,737	3.8%	955	1.3%	6,865	9.6%

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Current House Districts
Voting Age Population Totals

DISTRICT	Voting Age Pop.	VAP White	% VAP White	VAP Black	% VAP Black	VAP AIAN	% VAP AIAN	VAP Asian	% VAP Asian	VAP HawPI	% VAP HawPI	VAP Other	% VAP Other	VAP Multi	% VAP Multi	VAP Hispanic	% VAP Hispanic
1	57,833	54,688	94.6%	2,226	3.8%	354	0.6%	187	0.3%	24	0.0%	286	0.5%	68	0.1%	672	1.2%
2	54,630	52,627	96.3%	1,334	2.4%	231	0.4%	183	0.3%	4	0.0%	219	0.4%	32	0.1%	411	0.8%
3	53,177	51,247	96.4%	1,377	2.6%	224	0.4%	219	0.4%	15	0.0%	70	0.1%	25	0.0%	242	0.5%
4	58,842	56,463	96.0%	1,385	2.4%	281	0.5%	292	0.5%	17	0.0%	343	0.6%	61	0.1%	726	1.2%
5	55,154	52,877	95.9%	1,214	2.2%	286	0.5%	161	0.3%	12	0.0%	544	1.0%	60	0.1%	1,191	2.2%
6	58,276	54,886	94.2%	2,493	4.3%	274	0.5%	373	0.6%	15	0.0%	181	0.3%	54	0.1%	508	0.9%
7	62,214	56,718	91.2%	3,122	5.0%	337	0.5%	1,390	2.2%	38	0.1%	449	0.7%	160	0.3%	1,287	2.1%
8	58,528	53,302	91.1%	3,029	5.2%	262	0.4%	1,411	2.4%	27	0.0%	416	0.7%	81	0.1%	984	1.7%
9	65,128	57,791	88.7%	5,958	9.1%	343	0.5%	279	0.4%	25	0.0%	670	1.0%	62	0.1%	1,279	2.0%
10	54,788	46,325	84.6%	7,076	12.9%	255	0.5%	143	0.3%	15	0.0%	917	1.7%	55	0.1%	1,404	2.6%
11	56,244	34,278	60.9%	18,975	33.7%	326	0.6%	924	1.6%	28	0.0%	1,409	2.5%	302	0.5%	2,891	5.1%
12	64,081	56,094	87.5%	2,911	4.5%	300	0.5%	4,130	6.4%	52	0.1%	419	0.7%	175	0.3%	1,375	2.1%
13	131,503	88,513	67.3%	13,739	10.4%	873	0.7%	21,357	16.2%	146	0.1%	5,979	4.5%	896	0.7%	14,529	11.0%
14	51,053	30,437	59.6%	19,255	37.7%	221	0.4%	413	0.8%	12	0.0%	598	1.2%	117	0.2%	1,102	2.2%
15	61,155	58,102	95.0%	1,314	2.1%	354	0.6%	332	0.5%	23	0.0%	943	1.5%	87	0.1%	1,970	3.2%
16	55,023	40,488	73.6%	13,093	23.8%	241	0.4%	277	0.5%	18	0.0%	793	1.4%	113	0.2%	1,386	2.5%
17	58,033	52,464	90.4%	3,299	5.7%	317	0.5%	1,317	2.3%	32	0.1%	492	0.8%	112	0.2%	1,336	2.3%
18	62,954	56,490	89.7%	3,879	6.2%	477	0.8%	831	1.3%	46	0.1%	1,083	1.7%	148	0.2%	2,663	4.2%
19	61,053	56,236	92.1%	3,714	6.1%	374	0.6%	464	0.8%	13	0.0%	196	0.3%	56	0.1%	679	1.1%
20	60,846	55,420	91.1%	3,945	6.5%	259	0.4%	479	0.8%	23	0.0%	627	1.0%	93	0.2%	1,266	2.1%
21	55,998	33,867	60.5%	13,452	24.0%	428	0.8%	6,324	11.3%	111	0.2%	1,298	2.3%	518	0.9%	3,647	6.5%
22	61,006	52,306	85.7%	7,175	11.8%	357	0.6%	626	1.0%	28	0.0%	381	0.6%	133	0.2%	903	1.5%
23	64,845	44,229	68.2%	17,493	27.0%	408	0.6%	1,565	2.4%	36	0.1%	827	1.3%	287	0.4%	1,773	2.7%
24	58,206	51,393	88.3%	5,235	9.0%	609	1.0%	472	0.8%	42	0.1%	312	0.5%	143	0.2%	891	1.5%
25	64,291	58,808	91.5%	3,559	5.5%	326	0.5%	594	0.9%	20	0.0%	855	1.3%	129	0.2%	1,911	3.0%
26	67,195	58,129	86.5%	2,849	4.2%	390	0.6%	1,923	2.9%	76	0.1%	3,625	5.4%	203	0.3%	6,411	9.5%
27	64,804	41,598	64.2%	17,169	26.5%	486	0.7%	2,368	3.7%	59	0.1%	2,713	4.2%	413	0.6%	4,712	7.3%
28	70,257	51,913	73.9%	12,571	17.9%	627	0.9%	2,251	3.2%	82	0.1%	2,363	3.4%	450	0.6%	5,178	7.4%
29	66,863	58,376	87.3%	4,022	6.0%	400	0.6%	1,158	1.7%	38	0.1%	2,700	4.0%	171	0.3%	4,935	7.4%
30	67,963	54,866	80.7%	9,776	14.4%	501	0.7%	805	1.2%	60	0.1%	1,752	2.6%	203	0.3%	3,394	5.0%
31	63,042	37,754	59.9%	14,459	22.9%	646	1.0%	4,255	6.7%	126	0.2%	5,207	8.3%	593	0.9%	11,137	17.7%
32	78,679	56,041	71.2%	6,013	7.6%	351	0.4%	12,160	15.5%	88	0.1%	3,462	4.4%	544	0.7%	8,388	10.7%
33	79,525	65,772	82.7%	5,469	6.9%	459	0.6%	4,351	5.5%	68	0.1%	3,052	3.8%	354	0.4%	7,024	8.8%
34	55,355	42,350	76.5%	1,757	3.2%	180	0.3%	10,066	18.2%	52	0.1%	696	1.3%	254	0.5%	2,814	5.1%
35	66,402	47,589	71.7%	3,170	4.8%	260	0.4%	12,944	19.5%	53	0.1%	2,054	3.1%	332	0.5%	5,544	8.3%
36	57,195	42,307	74.0%	4,552	8.0%	293	0.5%	7,397	12.9%	43	0.1%	2,302	4.0%	301	0.5%	5,607	9.8%

Current House Districts
Voting Age Population Totals

DISTRICT	Voting Age Pop.	VAP White	% VAP White	VAP Black	% VAP Black	VAP AIAN	% VAP AIAN	VAP Asian	% VAP Asian	VAP HawPI	% VAP HawPI	VAP Other	% VAP Other	VAP Multi	% VAP Multi	VAP Hispanic	% VAP Hispanic
37	59,812	40,905	68.4%	3,936	6.6%	365	0.6%	11,585	19.4%	65	0.1%	2,612	4.4%	344	0.6%	7,046	11.8%
38	59,896	34,059	56.9%	6,089	10.2%	463	0.8%	10,842	18.1%	53	0.1%	7,896	13.2%	494	0.8%	16,382	27.4%
39	60,143	34,022	56.6%	3,913	6.5%	442	0.7%	14,795	24.6%	70	0.1%	6,467	10.8%	434	0.7%	13,291	22.1%
40	59,244	37,817	63.8%	3,893	6.6%	270	0.5%	14,415	24.3%	67	0.1%	2,404	4.1%	378	0.6%	6,000	10.1%
41	52,989	37,325	70.4%	3,340	6.3%	256	0.5%	9,641	18.2%	61	0.1%	2,097	4.0%	269	0.5%	6,183	11.7%
42	59,031	37,264	63.1%	8,305	14.1%	352	0.6%	10,175	17.2%	122	0.2%	2,377	4.0%	436	0.7%	6,470	11.0%
43	59,703	37,859	63.4%	9,260	15.5%	368	0.6%	8,491	14.2%	78	0.1%	3,224	5.4%	423	0.7%	7,920	13.3%
44	59,332	34,015	57.3%	12,708	21.4%	423	0.7%	4,622	7.8%	76	0.1%	6,929	11.7%	559	0.9%	13,116	22.1%
45	65,973	52,192	79.1%	7,314	11.1%	402	0.6%	3,324	5.0%	75	0.1%	2,313	3.5%	352	0.5%	5,727	8.7%
46	64,174	33,773	52.6%	18,289	28.5%	385	0.6%	6,410	10.0%	97	0.2%	4,563	7.1%	657	1.0%	10,034	15.6%
47	65,969	48,804	74.0%	4,629	7.0%	583	0.9%	7,184	10.9%	68	0.1%	4,250	6.4%	471	0.7%	9,264	14.0%
48	71,185	56,759	79.7%	4,278	6.0%	369	0.5%	7,804	11.0%	94	0.1%	1,514	2.1%	369	0.5%	5,510	7.7%
49	54,485	28,619	52.5%	9,430	17.3%	683	1.3%	5,137	9.4%	85	0.2%	9,874	18.1%	657	1.2%	19,146	35.1%
50	59,878	36,435	61.1%	8,428	14.1%	523	0.9%	4,223	7.1%	96	0.2%	9,474	15.9%	499	0.8%	17,766	29.8%
51	58,572	33,900	59.9%	12,060	21.3%	576	1.0%	4,437	7.8%	102	0.2%	4,898	8.7%	599	1.1%	10,491	18.5%
52	69,541	38,230	52.1%	19,821	28.5%	615	0.9%	5,553	8.0%	150	0.2%	6,342	9.1%	830	1.2%	12,932	18.6%
53	82,455	42,414	67.9%	2,710	4.3%	379	0.6%	13,218	21.2%	49	0.1%	3,297	5.3%	388	0.6%	8,171	13.1%
54	70,835	54,222	76.5%	11,673	16.5%	539	0.8%	1,867	2.6%	119	0.2%	2,064	2.9%	351	0.5%	4,558	6.4%
55	60,698	52,470	86.4%	6,292	10.4%	381	0.6%	952	1.6%	26	0.0%	442	0.7%	135	0.2%	1,140	1.9%
56	70,975	55,525	78.2%	10,141	14.3%	362	0.5%	4,110	5.8%	35	0.1%	550	0.8%	249	0.4%	1,581	2.2%
57	62,660	45,968	73.3%	9,846	15.4%	350	0.6%	4,943	7.9%	38	0.1%	1,432	2.3%	283	0.5%	3,461	5.5%
58	67,486	57,799	85.6%	5,908	8.8%	370	0.5%	2,088	3.1%	45	0.1%	1,120	1.7%	158	0.2%	2,371	3.5%
59	61,131	44,565	72.9%	15,177	24.8%	364	0.6%	369	0.6%	28	0.0%	472	0.8%	155	0.3%	1,089	1.8%
60	57,699	37,024	64.2%	19,453	33.7%	297	0.5%	328	0.6%	23	0.0%	439	0.8%	135	0.2%	939	1.6%
61	56,775	36,317	64.0%	18,985	33.4%	353	0.6%	259	0.5%	15	0.0%	680	1.2%	166	0.3%	1,363	2.4%
62	58,854	40,463	68.8%	15,075	25.6%	536	0.9%	1,041	1.8%	97	0.2%	1,325	2.3%	317	0.5%	3,047	5.2%
63	58,013	22,535	38.8%	33,723	58.1%	291	0.5%	442	0.8%	29	0.0%	684	1.2%	309	0.5%	1,472	2.5%
64	67,121	49,790	74.2%	13,993	20.8%	409	0.6%	1,747	2.6%	58	0.1%	829	1.2%	295	0.4%	2,102	3.1%
65	66,205	56,651	85.6%	6,440	9.7%	301	0.5%	2,240	3.4%	29	0.0%	385	0.6%	159	0.2%	1,359	2.1%
66	65,915	50,876	77.2%	10,845	16.5%	442	0.7%	2,253	3.4%	67	0.1%	1,138	1.7%	294	0.4%	2,663	4.0%
67	63,998	41,542	64.9%	4,232	6.6%	297	0.5%	14,811	23.1%	105	0.2%	2,691	4.2%	330	0.5%	6,585	10.3%
68	58,611	48,194	82.2%	6,825	11.6%	328	0.6%	2,064	3.5%	32	0.1%	939	1.6%	229	0.4%	2,258	3.9%
69	55,216	18,031	32.7%	31,075	56.3%	353	0.6%	1,102	2.0%	59	0.1%	4,137	7.5%	459	0.8%	6,344	11.5%
70	59,080	17,415	29.5%	36,480	61.8%	479	0.8%	736	1.2%	67	0.1%	3,354	5.7%	529	0.9%	5,218	8.8%
71	62,649	28,944	46.2%	28,989	46.3%	320	0.5%	3,199	5.1%	41	0.1%	612	1.0%	544	0.9%	1,771	2.8%
72	62,711	47,072	75.1%	7,125	11.4%	263	0.4%	6,786	10.8%	27	0.0%	1,123	1.8%	315	0.5%	2,759	4.4%

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Current House Districts
Voting Age Population Totals

DISTRICT	Voting Age Pop.	VAP White	% VAP White	VAP Black	% VAP Black	VAP AIAN	% VAP AIAN	VAP Asian	% VAP Asian	VAP HawPI	% VAP HawPI	VAP Other	% VAP Other	VAP Multi	% VAP Multi	VAP Hispanic	% VAP Hispanic
73	59,008	43,286	73.4%	9,723	16.5%	312	0.5%	3,225	5.5%	38	0.1%	2,124	3.6%	300	0.5%	4,107	7.0%
74	60,325	19,112	31.7%	37,822	62.7%	748	1.2%	1,218	2.0%	38	0.1%	935	1.5%	452	0.7%	1,844	3.1%
75	56,367	24,072	42.7%	31,173	55.3%	233	0.4%	230	0.4%	20	0.0%	469	0.8%	170	0.3%	931	1.7%
76	69,266	48,008	69.3%	18,114	26.2%	463	0.7%	1,809	2.6%	56	0.1%	508	0.7%	308	0.4%	1,680	2.4%
77	56,134	20,967	37.4%	32,306	57.6%	387	0.7%	994	1.8%	37	0.1%	1,044	1.9%	399	0.7%	2,232	4.0%
78	60,892	46,102	75.7%	10,587	17.4%	421	0.7%	2,885	4.7%	74	0.1%	529	0.9%	294	0.5%	2,099	3.4%
79	54,594	29,973	54.9%	21,493	39.4%	424	0.8%	1,670	3.1%	58	0.1%	549	1.0%	427	0.8%	1,732	3.2%
80	55,645	22,856	41.1%	30,270	54.4%	333	0.6%	1,053	1.9%	88	0.2%	662	1.2%	383	0.7%	1,598	2.9%
81	55,612	42,905	77.2%	8,661	15.6%	480	0.9%	2,148	3.9%	100	0.2%	999	1.8%	319	0.6%	2,915	5.2%
82	56,016	48,540	86.7%	4,387	7.8%	378	0.7%	1,554	2.8%	79	0.1%	800	1.4%	278	0.5%	2,349	4.2%
83	57,417	40,910	71.3%	10,864	18.9%	501	0.9%	3,376	5.9%	99	0.2%	1,228	2.1%	439	0.8%	3,231	5.6%
84	57,150	37,686	65.9%	12,115	21.2%	439	0.8%	4,957	8.7%	156	0.3%	1,325	2.3%	472	0.8%	3,674	6.4%
85	56,846	38,396	67.5%	11,534	20.3%	431	0.8%	5,089	8.9%	96	0.2%	917	1.6%	403	0.7%	2,676	4.7%
86	66,342	35,076	52.9%	6,438	9.7%	414	0.6%	15,537	23.4%	59	0.1%	8,175	12.3%	643	1.0%	15,239	23.0%
87	54,818	36,228	66.1%	13,263	24.2%	690	1.3%	2,236	4.1%	140	0.3%	1,745	3.2%	516	0.9%	4,159	7.6%
88	66,826	51,312	76.8%	9,736	14.6%	492	0.7%	2,161	3.2%	110	0.2%	2,598	3.9%	417	0.6%	5,779	8.6%
89	56,922	23,198	40.8%	29,865	52.5%	429	0.8%	1,815	3.2%	89	0.2%	1,000	1.8%	526	0.9%	2,606	4.6%
90	52,752	18,964	35.9%	30,024	56.9%	348	0.7%	1,779	3.4%	81	0.2%	1,053	2.0%	503	1.0%	2,536	4.8%
91	49,375	38,682	78.3%	7,832	15.9%	376	0.8%	1,526	3.1%	63	0.1%	610	1.2%	266	0.6%	1,638	3.3%
92	54,472	17,406	32.0%	33,853	62.1%	422	0.8%	1,246	2.3%	69	0.1%	731	1.3%	745	1.4%	2,141	3.9%
93	55,175	30,636	55.5%	18,500	33.5%	462	0.8%	2,524	4.6%	130	0.2%	2,346	4.3%	577	1.0%	5,017	9.1%
94	55,572	37,716	67.9%	13,537	24.4%	475	0.9%	2,045	3.7%	110	0.2%	1,133	2.0%	556	1.0%	3,205	5.8%
95	51,008	17,021	33.4%	31,444	61.6%	331	0.6%	913	1.8%	56	0.1%	642	1.3%	601	1.2%	1,686	3.3%
96	68,293	53,461	78.3%	10,024	14.7%	456	0.7%	3,030	4.4%	110	0.2%	798	1.2%	414	0.6%	2,404	3.5%
97	67,243	52,599	78.2%	12,306	18.3%	923	1.4%	667	1.0%	40	0.1%	461	0.7%	247	0.4%	1,268	1.9%
98	59,650	48,573	81.4%	9,383	15.7%	539	0.9%	494	0.8%	36	0.1%	428	0.7%	197	0.3%	1,153	1.9%
99	63,601	46,220	72.7%	15,274	24.0%	527	0.8%	521	0.8%	33	0.1%	809	1.3%	217	0.3%	1,921	3.0%
100	61,071	38,910	63.7%	17,183	28.1%	551	0.9%	1,362	2.2%	145	0.2%	2,046	3.4%	874	1.4%	5,338	8.7%

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Population Totals

DISTRICT	Total Population	Target	Difference	Deviation
1	80,508	80,010	498	0.6%
2	79,491	80,010	-519	-0.6%
3	80,583	80,010	573	0.7%
4	80,446	80,010	436	0.5%
5	80,600	80,010	590	0.7%
6	79,608	80,010	-402	-0.5%
7	80,146	80,010	136	0.2%
8	80,685	80,010	675	0.8%
9	80,574	80,010	564	0.7%
10	80,617	80,010	607	0.8%
11	80,132	80,010	122	0.2%
12	80,492	80,010	482	0.6%
13	80,579	80,010	569	0.7%
14	79,407	80,010	-603	-0.8%
15	80,630	80,010	620	0.8%
16	79,692	80,010	-318	-0.4%
17	80,631	80,010	621	0.8%
18	79,450	80,010	-560	-0.7%
19	80,080	80,010	70	0.1%
20	79,334	80,010	-676	-0.8%
21	79,608	80,010	-402	-0.5%
22	79,307	80,010	-703	-0.9%
23	79,330	80,010	-680	-0.9%
24	79,678	80,010	-332	-0.4%
25	80,011	80,010	1	0.0%
26	80,688	80,010	678	0.8%
27	79,381	80,010	-629	-0.8%
28	79,304	80,010	-706	-0.9%
29	79,851	80,010	-159	-0.2%
30	80,583	80,010	573	0.7%
31	79,210	80,010	-800	-1.0%
32	80,268	80,010	258	0.3%
33	80,550	80,010	540	0.7%
34	80,722	80,010	712	0.9%
35	80,213	80,010	203	0.3%
36	79,746	80,010	-264	-0.3%
37	80,255	80,010	245	0.3%
38	80,758	80,010	748	0.9%
39	80,710	80,010	700	0.9%
40	80,729	80,010	719	0.9%
41	80,792	80,010	782	1.0%
42	79,964	80,010	-46	-0.1%
43	80,750	80,010	740	0.9%
44	80,796	80,010	786	1.0%
45	80,240	80,010	230	0.3%
46	80,333	80,010	323	0.4%
47	80,757	80,010	747	0.9%
48	79,492	80,010	-518	-0.6%
49	80,609	80,010	599	0.7%
50	80,677	80,010	667	0.8%
51	80,372	80,010	362	0.5%

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Population Totals

DISTRICT	Total Population	Target	Difference	Deviation
52	79,290	80,010	-720	-0.9%
53	80,049	80,010	39	0.0%
54	80,155	80,010	145	0.2%
55	79,578	80,010	-432	-0.5%
56	79,271	80,010	-739	-0.9%
57	80,778	80,010	768	1.0%
58	80,767	80,010	757	0.9%
59	79,345	80,010	-665	-0.8%
60	79,219	80,010	-791	-1.0%
61	79,792	80,010	-218	-0.3%
62	79,677	80,010	-333	-0.4%
63	79,602	80,010	-408	-0.5%
64	79,262	80,010	-748	-0.9%
65	79,364	80,010	-646	-0.8%
66	79,397	80,010	-613	-0.8%
67	79,633	80,010	-377	-0.5%
68	79,611	80,010	-399	-0.5%
69	79,386	80,010	-624	-0.8%
70	79,382	80,010	-628	-0.8%
71	80,322	80,010	312	0.4%
72	80,764	80,010	754	0.9%
73	80,135	80,010	125	0.2%
74	79,594	80,010	-416	-0.5%
75	79,295	80,010	-715	-0.9%
76	80,313	80,010	303	0.4%
77	79,627	80,010	-383	-0.5%
78	80,475	80,010	465	0.6%
79	80,243	80,010	233	0.3%
80	80,705	80,010	695	0.9%
81	79,438	80,010	-572	-0.7%
82	80,463	80,010	453	0.6%
83	79,538	80,010	-472	-0.6%
84	80,281	80,010	271	0.3%
85	80,800	80,010	790	1.0%
86	80,747	80,010	737	0.9%
87	79,275	80,010	-735	-0.9%
88	80,191	80,010	181	0.2%
89	79,614	80,010	-396	-0.5%
90	80,425	80,010	415	0.5%
91	79,229	80,010	-781	-1.0%
92	79,689	80,010	-321	-0.4%
93	79,211	80,010	-799	-1.0%
94	79,429	80,010	-581	-0.7%
95	80,071	80,010	61	0.1%
96	79,217	80,010	-793	-1.0%
97	79,386	80,010	-624	-0.8%
98	79,251	80,010	-759	-0.9%
99	80,332	80,010	322	0.4%
100	80,037	80,010	27	0.0%

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Racial Demographics

DISTRICT	Total Population	White	% White	Black	% Black	AIAN	% AIAN	Asian	% Asian	HawPI	% HawPI	Other	% Other	Multi	% Multi	Total Hispanic	% Hispanic
1	80,508	75,238	94.7%	2,866	3.6%	463	0.6%	358	0.4%	36	0.0%	449	0.6%	98	0.1%	1,032	1.3%
2	79,491	45,289	57.0%	20,362	25.6%	694	0.9%	5,598	7.0%	183	0.2%	6,208	7.8%	1,157	1.5%	14,019	17.6%
3	80,583	77,178	95.8%	2,400	3.0%	324	0.4%	417	0.5%	23	0.0%	170	0.2%	71	0.1%	471	0.6%
4	80,446	77,768	96.7%	1,655	2.1%	327	0.4%	264	0.4%	15	0.0%	351	0.4%	46	0.1%	833	1.0%
5	80,600	76,080	94.4%	2,580	3.2%	393	0.5%	343	0.4%	33	0.0%	1,058	1.3%	133	0.2%	2,219	2.8%
6	79,608	76,371	95.9%	1,790	2.2%	378	0.5%	297	0.4%	14	0.0%	679	0.9%	79	0.1%	1,348	1.7%
7	80,146	74,106	92.5%	3,612	4.5%	408	0.5%	1,303	1.6%	32	0.0%	518	0.6%	165	0.2%	1,636	2.0%
8	80,685	74,011	91.7%	3,652	4.5%	438	0.5%	1,722	2.1%	32	0.0%	675	0.8%	155	0.2%	1,558	1.9%
9	80,574	69,709	86.5%	8,389	10.4%	428	0.5%	362	0.4%	26	0.0%	1,557	1.9%	101	0.1%	2,349	2.9%
10	80,617	60,881	75.5%	7,376	9.1%	489	0.6%	6,817	8.5%	64	0.1%	4,421	5.5%	569	0.7%	9,800	12.2%
11	80,132	47,632	59.4%	27,648	34.5%	420	0.5%	1,596	2.0%	56	0.1%	2,261	2.8%	519	0.6%	4,734	5.9%
12	80,492	70,200	87.2%	3,863	4.8%	424	0.5%	5,015	6.2%	52	0.1%	689	0.9%	249	0.3%	1,959	2.4%
13	80,579	46,642	60.4%	11,369	14.1%	634	0.8%	8,593	10.7%	94	0.1%	10,388	12.9%	859	1.1%	20,063	24.9%
14	79,407	47,662	60.3%	28,920	36.4%	342	0.4%	634	0.8%	27	0.0%	1,379	1.7%	243	0.3%	2,407	3.0%
15	80,630	75,913	94.1%	1,904	2.4%	517	0.6%	485	0.6%	31	0.0%	1,627	2.0%	153	0.2%	3,386	4.2%
16	79,692	54,827	68.8%	22,356	28.1%	372	0.5%	437	0.5%	18	0.0%	1,491	1.9%	189	0.2%	2,628	3.3%
17	80,531	71,273	88.4%	5,839	7.2%	410	0.5%	2,111	2.6%	56	0.1%	737	0.9%	205	0.3%	2,059	2.6%
18	79,450	69,073	86.9%	6,396	8.1%	644	0.8%	1,288	1.6%	63	0.1%	1,750	2.2%	236	0.3%	4,252	5.4%
19	80,080	73,554	91.9%	5,114	6.4%	507	0.6%	496	0.6%	31	0.0%	299	0.4%	109	0.1%	1,019	1.3%
20	79,334	69,268	87.3%	7,495	9.4%	432	0.5%	667	0.8%	42	0.1%	1,200	1.5%	230	0.3%	2,580	3.3%
21	79,608	45,467	57.1%	20,209	25.4%	519	0.8%	10,340	13.0%	136	0.2%	1,798	2.3%	1,122	1.4%	5,567	7.0%
22	79,307	59,135	74.6%	17,564	22.2%	425	0.5%	1,165	1.5%	40	0.1%	659	0.8%	299	0.4%	1,773	2.2%
23	79,330	62,083	78.3%	13,129	16.5%	520	0.7%	2,185	2.8%	43	0.1%	1,034	1.3%	336	0.4%	2,087	2.6%
24	79,678	70,664	88.7%	6,873	8.6%	796	1.0%	590	0.7%	50	0.1%	500	0.6%	185	0.2%	1,424	1.8%
25	80,011	73,739	92.2%	3,153	3.9%	361	0.5%	1,202	1.5%	17	0.0%	1,414	1.8%	126	0.2%	2,893	3.6%
26	80,688	67,806	84.0%	4,085	5.1%	508	0.8%	2,338	2.9%	78	0.1%	5,542	6.9%	331	0.4%	9,906	12.3%
27	79,381	56,899	71.7%	15,861	20.1%	612	0.8%	3,006	3.8%	76	0.1%	2,223	2.8%	604	0.8%	5,022	6.3%
28	79,304	56,205	70.9%	15,873	20.0%	772	1.0%	2,555	3.2%	119	0.2%	3,012	3.8%	767	1.0%	7,076	8.9%
29	79,851	68,575	85.9%	5,482	6.9%	529	0.7%	1,318	1.7%	41	0.1%	3,606	4.5%	300	0.4%	6,597	8.3%
30	80,583	62,914	78.1%	12,893	16.0%	607	0.8%	1,060	1.3%	83	0.1%	2,667	3.3%	359	0.4%	5,030	6.2%
31	79,210	50,345	63.6%	16,887	21.3%	786	1.0%	5,459	6.9%	180	0.2%	4,661	5.9%	910	1.1%	11,324	14.3%
32	80,268	55,738	69.4%	6,514	8.1%	379	0.5%	14,332	17.9%	76	0.1%	2,533	3.2%	696	0.9%	7,420	9.2%
33	80,550	70,393	87.4%	4,466	5.5%	477	0.6%	2,800	3.5%	75	0.1%	1,985	2.5%	354	0.4%	5,090	6.3%
34	80,722	61,693	76.4%	2,920	3.6%	286	0.4%	13,315	16.5%	79	0.1%	1,987	2.5%	441	0.5%	5,819	7.2%
35	80,213	53,780	67.0%	4,175	5.2%	376	0.5%	18,124	22.6%	84	0.1%	3,122	3.9%	552	0.7%	8,037	10.0%
36	79,746	53,210	66.7%	7,677	9.6%	453	0.6%	14,093	17.7%	55	0.1%	3,598	4.5%	660	0.8%	8,819	11.1%

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Racial Demographics

DISTRICT	Total Population	White	% White	Black	% Black	AIAN	% AIAN	Asian	% Asian	HawPI	% HawPI	Other	% Other	Multi	% Multi	Total Hispanic	% Hispanic
37	80,255	47,377	59.0%	6,773	8.4%	487	0.6%	20,703	25.8%	75	0.1%	4,142	5.2%	698	0.9%	10,555	13.2%
38	80,758	42,448	52.6%	8,220	10.2%	764	0.9%	16,430	20.3%	90	0.1%	12,070	14.9%	736	0.9%	25,694	31.8%
39	80,710	46,676	58.1%	7,970	9.9%	608	0.8%	17,106	21.2%	104	0.1%	7,296	9.0%	750	0.9%	15,374	19.0%
40	80,729	55,837	69.2%	5,581	6.9%	453	0.6%	15,153	18.8%	125	0.2%	2,995	3.7%	585	0.7%	7,868	9.7%
41	80,792	54,579	67.6%	5,080	6.3%	420	0.5%	16,675	20.6%	105	0.1%	3,398	4.2%	535	0.7%	9,941	12.3%
42	79,964	55,174	69.0%	8,666	10.8%	492	0.6%	12,522	15.7%	145	0.2%	2,280	2.9%	685	0.9%	7,461	9.3%
43	80,750	47,821	59.2%	14,789	18.3%	547	0.7%	11,263	13.9%	117	0.1%	5,415	6.7%	798	1.0%	12,611	15.6%
44	80,796	44,799	55.4%	18,328	22.7%	631	0.8%	6,018	7.4%	123	0.2%	9,984	12.4%	913	1.1%	19,469	24.1%
45	80,240	59,905	74.7%	9,859	12.3%	610	0.8%	3,933	4.9%	94	0.1%	5,289	6.6%	550	0.7%	11,072	13.8%
46	80,333	41,531	51.7%	23,285	29.0%	484	0.6%	7,435	9.3%	112	0.1%	6,541	8.1%	945	1.2%	13,746	17.1%
47	80,757	61,673	76.4%	4,226	5.2%	702	0.9%	8,755	10.8%	101	0.1%	4,753	5.9%	547	0.7%	10,754	13.3%
48	79,492	63,919	80.4%	3,596	4.5%	372	0.5%	9,544	12.0%	73	0.1%	1,586	2.0%	402	0.5%	5,831	7.3%
49	80,609	42,754	53.0%	14,262	17.7%	734	0.9%	11,082	13.7%	145	0.2%	10,609	13.2%	1,023	1.3%	21,749	27.0%
50	80,677	50,040	62.0%	12,052	14.9%	687	0.9%	6,540	8.1%	143	0.2%	10,321	12.8%	894	1.1%	21,171	26.2%
51	80,372	55,284	68.8%	13,338	16.6%	791	1.0%	5,744	7.1%	148	0.2%	4,256	5.3%	829	1.0%	10,775	13.4%
52	79,290	33,564	42.3%	25,067	31.6%	1,042	1.3%	6,144	7.7%	128	0.2%	11,922	15.0%	1,423	1.8%	23,127	29.2%
53	80,049	48,549	60.6%	4,632	5.8%	604	0.8%	17,736	22.2%	59	0.1%	7,815	9.8%	654	0.8%	16,791	21.0%
54	80,155	58,394	72.9%	15,091	18.8%	609	0.8%	2,438	3.0%	137	0.2%	2,865	3.6%	621	0.8%	6,404	8.0%
55	79,578	63,245	79.5%	13,351	16.8%	658	0.8%	1,120	1.4%	54	0.1%	787	1.0%	363	0.5%	2,068	2.6%
56	79,271	62,856	79.3%	10,005	12.6%	421	0.5%	5,022	6.3%	51	0.1%	608	0.8%	308	0.4%	1,904	2.4%
57	80,778	55,937	69.2%	14,615	18.1%	513	0.6%	6,584	8.2%	70	0.1%	2,590	3.2%	469	0.6%	5,761	7.1%
58	80,767	71,271	88.2%	5,948	7.4%	453	0.6%	1,601	2.0%	38	0.0%	1,214	1.5%	242	0.3%	2,569	3.2%
59	79,345	61,136	77.1%	16,314	20.6%	456	0.6%	561	0.7%	50	0.1%	596	0.8%	230	0.3%	1,436	1.8%
60	79,219	50,287	63.5%	27,103	34.2%	439	0.6%	440	0.6%	25	0.0%	689	0.9%	236	0.3%	1,407	1.8%
61	79,792	50,089	62.8%	27,384	34.3%	537	0.7%	422	0.5%	30	0.0%	1,030	1.3%	300	0.4%	2,085	2.6%
62	79,677	52,025	65.3%	20,686	26.0%	720	0.9%	2,339	2.9%	139	0.2%	3,164	4.0%	604	0.8%	6,078	7.6%
63	79,602	28,243	35.5%	48,039	60.3%	440	0.6%	823	1.0%	85	0.1%	1,361	1.7%	611	0.8%	3,111	3.9%
64	79,262	57,100	72.0%	19,728	24.9%	563	0.7%	886	1.1%	55	0.1%	563	0.7%	367	0.5%	1,582	2.0%
65	79,364	64,601	81.4%	11,248	14.2%	383	0.5%	2,222	2.8%	38	0.0%	576	0.7%	296	0.4%	1,834	2.3%
66	79,397	60,025	75.6%	14,125	17.8%	539	0.7%	2,507	3.2%	75	0.1%	1,621	2.0%	505	0.6%	3,767	4.7%
67	79,633	53,298	66.9%	4,756	6.0%	328	0.4%	17,683	22.2%	128	0.2%	3,015	3.8%	425	0.5%	7,838	9.8%
68	79,611	69,144	86.9%	6,073	7.6%	353	0.4%	2,825	3.5%	46	0.1%	878	1.1%	292	0.4%	2,383	3.0%
69	79,388	24,416	30.8%	46,579	58.7%	467	0.6%	1,481	1.9%	89	0.1%	5,600	7.1%	754	0.9%	8,424	10.6%
70	79,382	23,130	29.1%	46,844	59.0%	662	0.8%	1,502	1.9%	84	0.1%	6,262	7.9%	898	1.1%	10,086	12.7%
71	80,322	26,832	33.4%	48,476	60.4%	360	0.4%	3,167	3.9%	49	0.1%	670	0.8%	768	1.0%	1,937	2.4%
72	80,764	59,396	73.5%	11,381	14.1%	417	0.5%	6,962	8.6%	45	0.1%	2,110	2.6%	453	0.6%	4,603	5.7%

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Racial Demographics

DISTRICT	Total Population	White	% White	Black	% Black	AIAN	% AIAN	Asian	% Asian	HawPI	% HawPI	Other	% Other	Multi	% Multi	Total Hispanic	% Hispanic
73	80,135	56,598	70.6%	11,764	14.7%	416	0.5%	7,807	9.7%	55	0.1%	2,934	3.7%	561	0.7%	6,074	7.6%
74	79,594	26,427	33.2%	48,211	60.6%	1,012	1.3%	1,746	2.2%	58	0.1%	1,403	1.8%	737	0.9%	2,784	3.5%
75	79,295	32,792	41.4%	44,635	56.3%	348	0.4%	326	0.4%	30	0.0%	871	1.1%	293	0.4%	1,733	2.2%
76	80,313	54,860	68.3%	21,093	26.3%	519	0.6%	2,569	3.2%	81	0.1%	685	0.9%	507	0.6%	2,419	3.0%
77	79,627	26,586	33.4%	48,940	61.5%	538	0.7%	1,268	1.6%	99	0.1%	1,445	1.8%	751	0.9%	3,518	4.4%
78	80,475	60,719	75.5%	13,832	17.2%	587	0.7%	3,772	4.7%	112	0.1%	689	1.1%	564	0.7%	3,408	4.2%
79	80,243	48,264	60.1%	25,207	31.4%	819	1.0%	2,655	3.3%	193	0.2%	1,701	2.1%	1,404	1.7%	5,690	7.1%
80	80,705	28,912	35.8%	47,835	59.3%	524	0.6%	1,488	1.8%	150	0.2%	1,003	1.2%	793	1.0%	2,720	3.4%
81	79,438	58,121	73.2%	15,414	19.4%	755	1.0%	2,708	3.4%	139	0.2%	1,625	2.0%	676	0.9%	4,525	5.7%
82	80,463	66,725	82.9%	8,314	10.3%	587	0.7%	2,693	3.3%	138	0.2%	1,446	1.8%	560	0.7%	4,252	5.3%
83	79,538	58,152	73.1%	13,407	16.9%	717	0.9%	4,392	5.5%	150	0.2%	1,966	2.5%	754	0.9%	5,196	6.5%
84	80,281	52,357	65.2%	17,161	21.4%	598	0.7%	7,049	8.8%	228	0.3%	1,997	2.5%	891	1.1%	6,168	7.7%
85	80,800	53,934	66.8%	16,822	20.8%	711	0.9%	6,348	7.9%	172	0.2%	1,914	2.4%	899	1.1%	5,317	6.6%
86	80,747	46,400	57.5%	6,804	8.4%	545	0.7%	17,169	21.3%	72	0.1%	8,989	11.1%	768	1.0%	17,163	21.3%
87	79,275	44,093	55.6%	7,083	8.9%	437	0.6%	21,108	26.6%	83	0.1%	5,698	7.2%	773	1.0%	11,761	14.8%
88	80,191	60,158	75.0%	12,389	15.4%	590	0.7%	2,631	3.3%	122	0.2%	3,649	4.6%	652	0.8%	7,188	9.0%
89	79,614	27,929	35.1%	46,676	58.6%	490	0.6%	2,208	2.8%	106	0.1%	1,259	1.6%	946	1.2%	3,565	4.5%
90	80,425	25,163	31.3%	48,097	59.8%	551	0.7%	3,422	4.3%	128	0.2%	1,886	2.3%	1,178	1.5%	4,873	6.1%
91	79,229	56,058	70.8%	16,428	20.7%	657	0.8%	3,840	4.8%	148	0.2%	1,273	1.6%	825	1.0%	3,591	4.5%
92	79,689	25,037	31.4%	49,849	62.6%	610	0.8%	1,675	2.1%	99	0.1%	1,042	1.3%	1,377	1.7%	3,430	4.3%
93	79,211	51,530	65.1%	19,753	24.9%	551	0.7%	4,006	5.1%	195	0.2%	2,225	2.8%	951	1.2%	5,723	7.2%
94	79,429	53,846	67.8%	18,342	23.1%	671	0.8%	3,036	3.8%	151	0.2%	2,417	3.0%	966	1.2%	5,773	7.3%
95	80,071	23,721	29.6%	50,522	63.1%	567	0.7%	1,834	2.3%	127	0.2%	1,913	2.4%	1,387	1.7%	5,035	6.3%
96	79,217	62,755	79.2%	11,559	14.6%	515	0.7%	2,648	3.3%	97	0.1%	1,149	1.5%	494	0.6%	3,357	4.2%
97	79,386	67,533	85.1%	8,709	11.0%	991	1.2%	1,232	1.6%	45	0.1%	575	0.7%	301	0.4%	1,606	2.0%
98	79,251	63,155	79.7%	13,524	17.1%	837	1.1%	731	0.9%	46	0.1%	654	0.8%	304	0.4%	1,870	2.4%
99	80,332	56,801	70.7%	20,397	25.4%	687	0.9%	763	0.9%	45	0.1%	1,286	1.6%	353	0.4%	2,971	3.7%
100	80,037	50,150	62.7%	23,768	29.7%	836	1.0%	1,646	2.1%	173	0.2%	2,868	3.6%	596	0.7%	6,573	8.2%

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Voting Age Population

DISTRICT	Voting Age Population	VAP White	% VAP White	VAP Black	% VAP Black	VAP AIAN	% VAP AIAN	VAP Asian	% VAP Asian	VAP HawPI	% VAP HawPI	VAP Other	% VAP Other	VAP Multi	% VAP Multi	Voting Age Hispanic	% VAP Hispanic
1	64,221	60,648	94.4%	2,482	3.9%	392	0.6%	266	0.4%	22	0.0%	334	0.5%	77	0.1%	754	1.2%
2	56,163	33,408	59.5%	13,686	24.4%	467	0.8%	3,894	6.9%	127	0.2%	3,999	7.1%	582	1.0%	8879	15.8%
3	64,745	62,065	95.9%	1,932	3.0%	267	0.4%	321	0.5%	20	0.0%	97	0.1%	43	0.1%	327	0.5%
4	64,195	62,070	96.7%	1,370	2.1%	263	0.4%	197	0.3%	7	0.0%	247	0.4%	41	0.1%	541	0.8%
5	64,337	61,274	95.2%	1,725	2.7%	313	0.5%	257	0.4%	25	0.0%	669	1.0%	74	0.1%	1353	2.1%
6	62,988	60,788	96.5%	1,231	2.0%	302	0.5%	212	0.3%	12	0.0%	402	0.6%	41	0.1%	813	1.3%
7	64,401	59,855	92.9%	2,606	4.0%	331	0.5%	1,123	1.7%	30	0.0%	339	0.5%	117	0.2%	1137	1.8%
8	63,208	58,656	92.8%	2,522	4.0%	341	0.5%	1,154	1.8%	22	0.0%	432	0.7%	79	0.1%	1012	1.6%
9	64,142	56,131	87.5%	6,385	10.0%	341	0.5%	252	0.4%	25	0.0%	940	1.5%	68	0.1%	1388	2.2%
10	57,050	44,095	77.3%	4,953	8.7%	305	0.5%	4,422	7.8%	47	0.1%	2,931	5.1%	297	0.5%	6259	11.0%
11	62,356	39,559	63.4%	19,412	31.1%	353	0.6%	1,169	1.9%	36	0.1%	1,509	2.4%	318	0.5%	3146	5.0%
12	69,034	60,408	87.5%	3,084	4.5%	337	0.5%	4,401	6.4%	51	0.1%	555	0.8%	198	0.3%	1618	2.3%
13	58,290	36,735	63.0%	7,701	13.2%	461	0.8%	6,080	10.4%	64	0.1%	6,752	11.6%	497	0.9%	12955	22.2%
14	62,379	39,414	63.2%	21,270	34.1%	260	0.4%	457	0.7%	18	0.0%	812	1.3%	148	0.2%	1461	2.3%
15	62,907	59,863	95.2%	1,209	1.9%	392	0.6%	346	0.6%	24	0.0%	997	1.6%	76	0.1%	2048	3.3%
16	63,086	44,381	70.3%	17,101	27.1%	263	0.4%	300	0.5%	14	0.0%	898	1.4%	109	0.2%	1595	2.5%
17	63,576	57,265	90.1%	3,890	6.1%	317	0.5%	1,473	2.3%	35	0.1%	472	0.7%	124	0.2%	1309	2.1%
18	59,686	52,508	88.0%	4,602	7.7%	460	0.8%	847	1.4%	47	0.1%	1,096	1.8%	126	0.2%	2635	4.4%
19	62,844	58,171	92.6%	3,726	5.9%	388	0.6%	299	0.5%	20	0.0%	174	0.3%	66	0.1%	639	1.0%
20	62,717	55,842	89.0%	5,214	8.3%	330	0.5%	476	0.8%	30	0.0%	690	1.1%	135	0.2%	1608	2.6%
21	58,656	34,776	59.3%	13,997	23.9%	388	0.7%	7,696	13.1%	93	0.2%	1,185	2.0%	521	0.9%	3432	5.9%
22	61,467	47,057	76.6%	12,606	20.5%	341	0.6%	810	1.3%	29	0.0%	437	0.7%	187	0.3%	1179	1.9%
23	63,982	51,425	80.4%	9,563	14.9%	423	0.7%	1,574	2.5%	34	0.1%	754	1.2%	209	0.3%	1543	2.4%
24	64,424	57,333	89.0%	5,506	8.5%	587	0.9%	472	0.7%	38	0.1%	355	0.6%	133	0.2%	990	1.5%
25	61,585	57,373	93.2%	2,232	3.6%	262	0.4%	769	1.2%	13	0.0%	853	1.4%	83	0.1%	1717	2.8%
26	65,566	56,466	86.1%	2,921	4.5%	376	0.6%	1,932	2.9%	76	0.1%	3,588	5.5%	207	0.3%	6380	9.7%
27	58,981	43,713	74.1%	10,874	18.4%	445	0.8%	2,143	3.6%	54	0.1%	1,438	2.4%	314	0.5%	3189	5.4%
28	58,388	43,126	73.9%	10,643	18.2%	547	0.9%	1,771	3.0%	80	0.1%	1,855	3.2%	366	0.6%	4374	7.5%
29	61,320	53,930	87.9%	3,655	6.0%	384	0.6%	950	1.5%	32	0.1%	2,204	3.6%	165	0.3%	4035	6.6%
30	61,276	48,944	79.9%	9,268	15.1%	452	0.7%	710	1.2%	56	0.1%	1,651	2.7%	195	0.3%	3171	5.2%
31	56,743	37,294	65.7%	11,510	20.3%	506	0.9%	3,792	6.7%	124	0.2%	3,025	5.3%	492	0.9%	7182	12.7%
32	55,263	39,133	70.8%	4,398	8.0%	228	0.4%	9,364	16.9%	51	0.1%	1,704	3.1%	385	0.7%	4881	8.8%
33	57,140	50,780	88.9%	2,848	5.0%	324	0.6%	1,737	3.0%	51	0.1%	1,226	2.1%	174	0.3%	3123	5.5%
34	57,978	44,921	77.5%	2,037	3.5%	193	0.3%	9,219	15.9%	53	0.1%	1,291	2.2%	264	0.5%	3835	6.6%
35	62,743	42,985	68.5%	3,213	5.1%	259	0.4%	13,543	21.6%	73	0.1%	2,306	3.7%	364	0.6%	5932	9.5%
36	61,859	43,038	69.6%	5,383	8.7%	309	0.5%	10,240	16.6%	49	0.1%	2,450	4.0%	390	0.6%	6069	9.8%

HB 5005 Passed 4/28/11, House Plan
Voting Age Population

DISTRICT	Voting Age Population	VAP White	% VAP White	VAP Black	% VAP Black	VAP AIAN	% VAP AIAN	VAP Asian	% VAP Asian	VAP HawPI	% VAP HawPI	VAP Other	% VAP Other	VAP Multi	% VAP Multi	Voting Age Hispanic	% VAP Hispanic
37	63,480	38,998	61.4%	5,117	8.1%	368	0.6%	15,501	24.4%	57	0.1%	3,013	4.7%	426	0.7%	7714	12.2%
38	62,463	33,957	54.3%	5,892	9.4%	563	0.9%	12,849	20.6%	58	0.1%	8,707	13.9%	507	0.8%	18684	29.9%
39	61,870	37,283	60.3%	5,616	9.1%	437	0.7%	12,757	20.6%	76	0.1%	5,240	8.5%	461	0.7%	10921	17.7%
40	58,715	41,056	70.3%	3,843	6.6%	314	0.5%	10,719	18.3%	73	0.1%	2,085	3.6%	325	0.6%	5322	9.1%
41	60,765	41,973	69.1%	3,467	5.7%	283	0.5%	12,276	20.2%	71	0.1%	2,388	3.9%	307	0.5%	6992	11.5%
42	58,066	41,053	70.7%	5,682	9.8%	344	0.6%	9,044	15.6%	101	0.2%	1,498	2.6%	344	0.6%	4910	8.5%
43	62,318	38,605	61.9%	10,680	17.1%	398	0.6%	8,316	13.3%	89	0.1%	3,754	6.0%	476	0.8%	8829	14.2%
44	59,112	33,967	57.5%	12,991	22.0%	415	0.7%	4,387	7.4%	85	0.1%	6,707	11.3%	560	0.9%	12893	21.8%
45	67,692	51,797	76.5%	7,774	11.5%	501	0.7%	3,217	4.8%	79	0.1%	3,918	5.8%	406	0.6%	8358	12.3%
46	65,262	35,868	54.1%	18,343	27.7%	402	0.6%	6,127	9.2%	96	0.1%	4,771	7.2%	655	1.0%	10253	15.5%
47	68,384	53,109	77.7%	3,395	5.0%	550	0.8%	7,141	10.4%	76	0.1%	3,709	5.4%	404	0.6%	8449	12.4%
48	64,068	51,895	81.0%	2,962	4.6%	290	0.5%	7,347	11.5%	62	0.1%	1,204	1.9%	308	0.5%	4435	6.9%
49	66,373	36,838	55.5%	11,102	16.7%	585	0.9%	9,093	13.7%	109	0.2%	7,909	11.9%	737	1.1%	16346	24.6%
50	55,689	35,574	63.9%	7,997	14.4%	438	0.8%	4,492	8.1%	90	0.2%	6,642	11.9%	456	0.8%	13405	24.1%
51	58,448	41,641	71.2%	8,991	15.4%	559	1.0%	3,986	6.8%	98	0.2%	2,745	4.7%	428	0.7%	6847	11.7%
52	56,592	25,644	45.3%	17,160	30.3%	677	1.2%	4,428	7.8%	100	0.2%	7,818	13.8%	765	1.4%	14987	26.5%
53	62,827	39,121	62.3%	3,426	5.5%	451	0.7%	13,659	21.7%	51	0.1%	5,667	9.0%	452	0.7%	12306	19.6%
54	57,249	42,858	74.9%	10,139	17.7%	434	0.8%	1,632	2.9%	83	0.1%	1,797	3.1%	306	0.5%	3932	6.9%
55	59,680	47,737	80.0%	9,978	16.7%	459	0.8%	765	1.3%	31	0.1%	502	0.8%	208	0.3%	1335	2.2%
56	58,745	46,976	80.0%	7,644	13.0%	315	0.5%	3,233	5.5%	37	0.1%	350	0.6%	190	0.3%	1142	1.9%
57	66,024	48,829	71.8%	10,826	15.9%	397	0.6%	5,775	8.5%	52	0.1%	1,817	2.7%	328	0.5%	4207	6.2%
58	61,395	54,936	89.5%	4,240	6.9%	314	0.5%	1,055	1.7%	31	0.1%	693	1.1%	126	0.2%	1524	2.5%
59	62,206	48,415	77.8%	12,466	20.0%	360	0.6%	387	0.6%	38	0.1%	396	0.6%	148	0.2%	941	1.5%
60	62,712	41,036	65.4%	20,399	32.5%	349	0.6%	333	0.5%	22	0.0%	425	0.7%	148	0.2%	927	1.5%
61	63,280	40,447	63.9%	21,215	33.5%	411	0.6%	293	0.5%	18	0.0%	699	1.1%	197	0.3%	1421	2.2%
62	61,022	41,265	67.6%	14,988	24.6%	548	0.9%	1,729	2.8%	85	0.1%	2,062	3.4%	345	0.6%	3959	6.5%
63	61,404	22,534	36.7%	36,553	59.5%	327	0.5%	636	1.0%	56	0.1%	918	1.5%	380	0.6%	2045	3.3%
64	61,722	45,123	73.1%	14,951	24.2%	422	0.7%	628	1.0%	36	0.1%	347	0.6%	205	0.3%	975	1.6%
65	59,232	48,341	81.6%	8,666	14.6%	274	0.5%	1,425	2.4%	22	0.0%	353	0.6%	151	0.3%	1142	1.9%
66	58,534	45,692	78.1%	9,403	16.1%	373	0.6%	1,781	3.0%	58	0.1%	980	1.7%	247	0.4%	2278	3.9%
67	57,154	39,122	68.5%	3,270	5.7%	236	0.4%	12,121	21.2%	89	0.2%	2,056	3.6%	260	0.5%	5329	9.3%
68	63,752	55,904	87.7%	4,624	7.3%	271	0.4%	2,110	3.3%	33	0.1%	620	1.0%	190	0.3%	1691	2.7%
69	62,538	21,682	34.7%	34,514	55.2%	390	0.6%	1,284	2.1%	65	0.1%	4,074	6.5%	529	0.8%	6060	9.7%
70	58,654	19,204	32.7%	33,063	56.4%	493	0.8%	1,137	1.9%	59	0.1%	4,176	7.1%	522	0.9%	6670	11.4%
71	66,230	24,970	37.7%	36,658	55.3%	325	0.5%	3,069	4.6%	41	0.1%	566	0.9%	601	0.9%	1616	2.4%
72	62,008	46,792	75.5%	8,308	13.4%	292	0.5%	4,891	7.9%	35	0.1%	1,424	2.3%	266	0.4%	3084	5.0%

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HB 5005 Passed 4/28/11, House Plan
Voting Age Population

DISTRICT	Voting Age Population	VAP White	% VAP White	VAP Black	% VAP Black	VAP AIAN	% VAP AIAN	VAP Asian	% VAP Asian	VAP HawPI	% VAP HawPI	VAP Other	% VAP Other	VAP Multi	% VAP Multi	Voting Age Hispanic	% VAP Hispanic
73	63,116	45,955	72.8%	8,550	13.5%	310	0.5%	5,860	9.3%	34	0.1%	2,044	3.2%	363	0.6%	4196	6.6%
74	60,478	22,359	37.0%	34,617	57.2%	800	1.3%	1,306	2.2%	37	0.1%	926	1.5%	433	0.7%	1806	3.0%
75	63,445	26,977	42.5%	35,167	55.4%	270	0.4%	250	0.4%	23	0.0%	570	0.9%	188	0.3%	1128	1.8%
76	59,747	41,918	70.2%	15,023	25.1%	386	0.6%	1,701	2.8%	46	0.1%	424	0.7%	249	0.4%	1460	2.4%
77	57,841	21,046	36.4%	33,997	58.8%	386	0.7%	914	1.6%	59	0.1%	1,038	1.8%	401	0.7%	2231	3.9%
78	60,410	46,088	76.3%	10,355	17.1%	438	0.7%	2,599	4.3%	68	0.1%	578	1.0%	284	0.5%	2127	3.5%
79	66,796	41,472	62.1%	19,677	29.5%	682	1.0%	2,244	3.4%	162	0.2%	1,450	2.2%	1,109	1.7%	4676	7.0%
80	60,871	23,739	39.0%	34,268	56.3%	383	0.6%	1,165	1.9%	91	0.1%	755	1.2%	470	0.8%	1833	3.0%
81	59,833	44,792	74.9%	11,130	18.6%	560	0.9%	1,830	3.1%	97	0.2%	1,077	1.8%	347	0.6%	2880	4.8%
82	63,348	53,757	84.9%	5,786	9.1%	464	0.7%	1,932	3.0%	98	0.2%	993	1.6%	318	0.5%	2843	4.5%
83	62,818	47,638	75.8%	9,500	15.1%	539	0.9%	3,260	5.2%	106	0.2%	1,359	2.2%	416	0.7%	3476	5.5%
84	58,742	39,207	66.7%	12,012	20.4%	443	0.8%	5,128	8.7%	162	0.3%	1,333	2.3%	459	0.8%	3917	6.7%
85	62,188	43,120	69.3%	11,770	18.9%	534	0.9%	4,817	7.7%	136	0.2%	1,329	2.1%	482	0.8%	3512	5.6%
86	59,286	34,944	58.9%	4,930	8.3%	371	0.6%	12,153	20.5%	49	0.1%	6,349	10.7%	490	0.8%	12059	20.3%
87	55,787	32,124	57.6%	4,831	8.7%	295	0.5%	14,180	25.4%	66	0.1%	3,853	6.9%	438	0.8%	7895	14.2%
88	58,354	45,104	77.3%	8,248	14.1%	418	0.7%	1,794	3.1%	89	0.2%	2,361	4.0%	340	0.6%	4545	7.8%
89	61,070	23,417	38.3%	33,869	55.5%	394	0.6%	1,800	2.9%	83	0.1%	942	1.5%	565	0.9%	2515	4.1%
90	60,204	20,960	34.8%	34,069	56.6%	422	0.7%	2,668	4.4%	83	0.1%	1,333	2.2%	669	1.1%	3258	5.4%
91	59,281	43,142	72.8%	11,626	19.6%	481	0.8%	2,676	4.5%	101	0.2%	801	1.4%	454	0.8%	2231	3.8%
92	61,309	20,662	33.7%	37,224	60.7%	472	0.8%	1,285	2.1%	71	0.1%	767	1.3%	828	1.4%	2264	3.7%
93	62,539	42,610	68.1%	14,122	22.6%	422	0.7%	3,164	5.1%	137	0.2%	1,565	2.5%	519	0.8%	3916	6.3%
94	62,412	44,092	70.6%	13,120	21.0%	528	0.8%	2,350	3.8%	105	0.2%	1,699	2.7%	518	0.8%	3895	6.2%
95	59,017	19,542	33.1%	35,394	60.0%	431	0.7%	1,411	2.4%	92	0.2%	1,374	2.3%	773	1.3%	3300	5.6%
96	61,067	49,447	81.0%	8,373	13.7%	354	0.6%	1,826	3.0%	72	0.1%	725	1.2%	270	0.4%	2119	3.5%
97	60,024	51,473	85.8%	6,497	10.8%	714	1.2%	802	1.3%	30	0.0%	349	0.6%	159	0.3%	969	1.6%
98	62,740	50,614	80.7%	10,318	16.4%	624	1.0%	502	0.8%	36	0.1%	446	0.7%	200	0.3%	1205	1.9%
99	63,534	46,161	72.7%	15,274	24.0%	525	0.8%	520	0.8%	33	0.1%	804	1.3%	217	0.3%	1916	3.0%
100	63,027	41,380	65.7%	17,393	27.6%	648	1.0%	1,248	2.0%	122	0.2%	1,893	3.0%	343	0.5%	4247	6.7%

HB 5005 Passed 4/28/11, House Plan
Election Data

DISTRICT	Rep. Gov '09	Dem. Gov '09	Rep. Lt. Gov '09	Dem. Lt. Gov '09	Rep. Att. Gen. '09	Dem. Att. Gen. '09	Rep. Pres. '08	Dem. Pres. '08	Other Pres. '08	Rep. U.S. Sen. '08	Dem. U.S. Sen. '08	Other U.S. Sen. '08
1	74%	26%	75%	25%	74%	26%	65%	33%	1%	39%	61%	1%
2	58%	42%	55%	45%	58%	44%	42%	57%	1%	33%	66%	1%
3	70%	30%	70%	30%	68%	32%	62%	37%	1%	37%	61%	1%
4	68%	32%	69%	31%	67%	33%	60%	39%	1%	38%	61%	1%
5	74%	26%	75%	25%	74%	26%	65%	33%	2%	43%	56%	1%
6	72%	28%	71%	29%	71%	29%	64%	34%	2%	40%	59%	1%
7	65%	35%	63%	37%	65%	35%	58%	40%	1%	35%	63%	1%
8	67%	33%	65%	35%	67%	33%	60%	39%	1%	38%	61%	1%
9	68%	32%	66%	34%	67%	33%	61%	38%	1%	36%	63%	1%
10	62%	38%	61%	39%	60%	40%	49%	50%	1%	38%	61%	1%
11	44%	56%	44%	56%	46%	54%	34%	65%	1%	22%	77%	1%
12	51%	49%	50%	50%	51%	49%	44%	54%	1%	26%	72%	1%
13	61%	39%	59%	41%	59%	41%	44%	55%	1%	36%	63%	1%
14	62%	38%	62%	38%	62%	38%	50%	49%	1%	31%	67%	1%
15	74%	26%	71%	29%	71%	29%	62%	37%	1%	47%	52%	1%
16	64%	36%	63%	37%	64%	36%	55%	44%	1%	31%	68%	1%
17	67%	33%	65%	35%	67%	33%	59%	40%	1%	39%	60%	1%
18	67%	33%	65%	35%	66%	34%	56%	43%	1%	43%	56%	1%
19	62%	38%	63%	37%	65%	35%	61%	38%	1%	39%	60%	1%
20	66%	34%	67%	33%	67%	33%	57%	42%	1%	42%	57%	1%
21	61%	39%	55%	45%	59%	41%	49%	50%	1%	35%	63%	1%
22	70%	30%	69%	31%	70%	30%	60%	39%	1%	43%	56%	1%
23	70%	30%	69%	31%	70%	30%	62%	37%	1%	47%	52%	1%
24	63%	37%	64%	36%	65%	35%	60%	39%	1%	42%	57%	1%
25	68%	32%	68%	32%	69%	31%	61%	38%	1%	45%	54%	1%
26	70%	30%	70%	30%	70%	30%	54%	45%	1%	41%	58%	1%
27	65%	35%	62%	38%	65%	35%	53%	46%	1%	41%	58%	1%
28	64%	36%	62%	38%	61%	39%	51%	48%	1%	37%	61%	1%
29	71%	29%	69%	31%	68%	32%	58%	41%	1%	41%	58%	1%
30	68%	32%	65%	35%	67%	33%	55%	44%	1%	40%	59%	1%
31	60%	40%	58%	42%	59%	41%	47%	53%	1%	37%	62%	1%
32	62%	38%	59%	41%	60%	40%	46%	54%	1%	38%	61%	1%
33	66%	34%	65%	35%	65%	35%	54%	45%	1%	42%	57%	1%
34	57%	43%	55%	45%	53%	47%	48%	51%	1%	38%	61%	1%
35	49%	51%	46%	54%	43%	57%	40%	59%	1%	32%	67%	1%
36	42%	58%	39%	61%	39%	61%	34%	65%	1%	28%	71%	1%
37	53%	47%	51%	49%	50%	50%	41%	58%	1%	33%	66%	1%

HB 5005 Passed 4/28/11, House Plan
Election Data

DISTRICT	Rep. Gov '09	Dem. Gov '09	Rep. Lt. Gov '09	Dem. Lt. Gov '09	Rep. Att. Gen. '09	Dem. Att. Gen. '09	Rep. Pres. '08	Dem. Pres. '08	Other Pres. '08	Rep. U.S. Sen. '08	Dem. U.S. Sen. '08	Other U.S. Sen. '08
38	44%	56%	42%	58%	41%	59%	37%	63%	1%	28%	70%	1%
39	50%	50%	47%	53%	47%	53%	41%	59%	1%	31%	68%	1%
40	65%	35%	63%	37%	62%	38%	51%	48%	1%	41%	58%	1%
41	53%	47%	50%	50%	50%	50%	43%	56%	1%	33%	66%	1%
42	58%	42%	55%	45%	55%	45%	47%	52%	1%	37%	62%	1%
43	45%	55%	43%	57%	43%	57%	36%	64%	1%	29%	70%	1%
44	46%	54%	44%	56%	43%	57%	36%	63%	1%	28%	71%	1%
45	37%	63%	35%	65%	35%	65%	31%	68%	1%	24%	75%	1%
46	37%	63%	34%	66%	34%	66%	27%	73%	1%	21%	78%	1%
47	33%	67%	31%	69%	31%	69%	31%	68%	1%	26%	73%	2%
48	40%	60%	38%	62%	37%	63%	36%	63%	1%	29%	70%	1%
49	32%	68%	31%	69%	31%	69%	28%	73%	1%	21%	77%	2%
50	63%	37%	60%	40%	61%	39%	46%	53%	1%	38%	61%	1%
51	62%	38%	59%	41%	60%	40%	49%	50%	1%	39%	60%	1%
52	46%	54%	43%	57%	44%	56%	29%	70%	1%	23%	75%	1%
53	42%	58%	40%	60%	39%	61%	35%	64%	1%	29%	70%	1%
54	66%	34%	64%	36%	63%	37%	51%	48%	1%	38%	61%	1%
55	68%	32%	66%	34%	68%	32%	58%	41%	1%	42%	56%	1%
56	71%	29%	68%	32%	70%	30%	59%	40%	1%	43%	56%	1%
57	35%	65%	32%	68%	34%	66%	28%	71%	1%	20%	78%	1%
58	66%	34%	63%	37%	65%	35%	56%	43%	1%	43%	56%	1%
59	67%	33%	66%	34%	67%	33%	58%	41%	1%	38%	61%	1%
60	62%	38%	63%	37%	64%	36%	51%	48%	1%	36%	63%	1%
61	66%	34%	65%	35%	67%	33%	53%	46%	1%	40%	59%	1%
62	67%	33%	64%	36%	66%	34%	54%	45%	1%	41%	58%	1%
63	41%	59%	40%	60%	42%	58%	29%	70%	1%	23%	76%	1%
64	66%	34%	64%	36%	65%	35%	58%	41%	1%	41%	57%	1%
65	73%	27%	70%	30%	73%	27%	63%	37%	1%	47%	51%	1%
66	75%	25%	72%	28%	74%	26%	63%	36%	1%	47%	52%	1%
67	58%	42%	56%	44%	56%	44%	46%	53%	1%	37%	62%	1%
68	64%	36%	61%	39%	63%	37%	54%	45%	1%	37%	62%	1%
69	23%	77%	22%	78%	24%	76%	15%	85%	1%	11%	87%	2%
70	31%	69%	30%	70%	32%	68%	22%	77%	1%	18%	81%	1%
71	19%	81%	20%	80%	21%	79%	13%	87%	1%	9%	89%	2%
72	66%	34%	63%	37%	65%	35%	54%	45%	1%	39%	60%	1%
73	66%	34%	63%	37%	65%	35%	53%	46%	1%	38%	61%	1%
74	34%	66%	33%	67%	35%	65%	26%	74%	1%	20%	79%	1%

HB 5005 Passed 4/28/11, House Plan

Election Data

DISTRICT	Rep. Gov '09	Dem. Gov '09	Rep. Lt. Gov '09	Dem. Lt. Gov '09	Rep. Att. Gen. '09	Dem. Att. Gen. '09	Rep. Pres. '08	Dem. Pres. '08	Other Pres. '08	Rep. U.S. Sen. '08	Dem. U.S. Sen. '08	Other U.S. Sen. '08
75	49%	51%	48%	52%	50%	50%	37%	62%	1%	26%	73%	1%
76	64%	36%	60%	40%	63%	37%	56%	43%	1%	42%	57%	1%
77	34%	66%	33%	67%	35%	65%	25%	75%	1%	18%	81%	1%
78	70%	30%	66%	34%	69%	31%	61%	38%	1%	46%	53%	1%
79	49%	51%	45%	55%	47%	53%	41%	58%	1%	28%	70%	1%
80	34%	66%	32%	68%	34%	66%	27%	73%	1%	20%	79%	1%
81	67%	33%	62%	38%	66%	34%	56%	43%	1%	40%	59%	1%
82	67%	33%	60%	40%	65%	35%	57%	42%	1%	38%	60%	1%
83	63%	37%	57%	43%	61%	39%	53%	46%	1%	36%	63%	1%
84	64%	36%	59%	41%	63%	37%	51%	49%	1%	36%	63%	1%
85	64%	36%	58%	42%	62%	38%	51%	48%	1%	36%	63%	1%
86	53%	47%	50%	50%	50%	50%	40%	59%	1%	32%	67%	1%
87	59%	41%	57%	43%	57%	43%	44%	55%	1%	36%	62%	1%
88	66%	32%	66%	34%	66%	34%	55%	45%	1%	41%	58%	1%
89	28%	72%	25%	75%	28%	72%	19%	81%	1%	13%	86%	1%
90	35%	65%	32%	68%	34%	66%	23%	77%	1%	16%	82%	1%
91	67%	33%	62%	38%	64%	36%	57%	42%	1%	41%	58%	1%
92	31%	69%	29%	71%	30%	70%	22%	77%	1%	16%	83%	1%
93	55%	45%	52%	48%	53%	47%	43%	56%	1%	31%	68%	2%
94	62%	38%	58%	42%	59%	41%	49%	50%	1%	36%	63%	1%
95	34%	66%	32%	68%	34%	66%	24%	76%	1%	18%	81%	1%
96	68%	32%	64%	36%	66%	34%	57%	42%	1%	42%	57%	1%
97	78%	22%	75%	25%	77%	23%	68%	31%	1%	51%	48%	1%
98	69%	31%	66%	34%	67%	33%	60%	39%	1%	41%	58%	1%
99	66%	34%	63%	37%	65%	35%	53%	46%	1%	37%	62%	1%
100	57%	43%	54%	46%	56%	44%	45%	54%	1%	30%	68%	1%

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Population Summary Report

Thursday April 9, 2015 1:32 PM

Plan: vaLD_DLS-PLAN-1_ENACTED-HB5005_od09a
Plan Type:
Administrator:
User:

DIST-RICT	POPU-LATION	DEVI-ATION	%DE-VN	[%NHB-POP]	TOT-VAP	[%NHB-VAP]
001	80,508	498	0.62	3.21%	64,221	3.70%
002	79,491	-519	-0.65	23.50%	56,163	23.19%
003	80,583	573	0.72	2.71%	64,745	2.91%
004	80,446	436	0.54	1.84%	64,195	2.05%
005	80,600	590	0.74	2.69%	64,337	2.54%
006	79,608	-402	-0.50	1.85%	62,988	1.84%
007	80,146	136	0.17	3.85%	64,401	3.79%
008	80,685	675	0.84	3.98%	63,208	3.79%
009	80,574	564	0.70	9.69%	64,142	9.78%
010	80,617	607	0.76	8.04%	57,050	8.18%
011	80,132	122	0.15	32.63%	62,356	30.37%
012	80,492	482	0.60	4.19%	69,034	4.12%
013	80,579	569	0.71	12.47%	58,290	12.42%
014	79,407	-603	-0.75	35.79%	62,379	33.86%
015	80,630	620	0.77	1.80%	62,907	1.74%
016	79,692	-318	-0.40	27.28%	63,086	26.83%
017	80,631	621	0.78	6.30%	63,576	5.82%
018	79,450	-560	-0.70	7.09%	59,686	7.40%
019	80,080	70	0.09	5.74%	62,844	5.74%
020	79,334	-676	-0.84	8.26%	62,717	7.91%
021	79,608	-402	-0.50	23.34%	58,656	22.83%
022	79,307	-703	-0.88	21.34%	61,467	20.20%
023	79,330	-680	-0.85	15.68%	63,982	14.61%
024	79,678	-332	-0.41	8.03%	64,424	8.30%
025	80,011	1	0.00	3.33%	61,585	3.42%
026	80,688	678	0.85	4.08%	65,566	3.90%
027	79,381	-629	-0.79	18.91%	58,981	17.89%
028	79,304	-706	-0.88	18.21%	58,388	17.41%
029	79,851	-159	-0.20	5.75%	61,320	5.56%
030	80,583	573	0.72	14.57%	61,276	14.68%
031	79,210	-800	-1.00	19.46%	56,743	19.25%
032	80,268	258	0.32	7.12%	55,263	7.42%
033	80,550	540	0.67	4.68%	57,140	4.68%
034	80,722	712	0.89	3.14%	57,978	3.28%

035	80,213	203	0.25	4.57%	62,743	4.70%
036	79,746	-264	-0.33	8.66%	61,859	8.13%
037	80,255	245	0.31	7.54%	63,480	7.44%
038	80,758	748	0.93	9.47%	62,463	8.92%
039	80,710	700	0.87	9.15%	61,870	8.64%
040	80,729	719	0.90	6.12%	58,415	6.15%
041	80,792	782	0.98	5.57%	60,765	5.38%
042	79,964	-46	-0.06	9.84%	58,066	9.27%
043	80,750	740	0.92	17.03%	62,318	16.34%
044	80,796	786	0.98	21.28%	59,112	21.10%
045	80,240	230	0.29	11.42%	67,692	10.85%
046	80,333	323	0.40	27.49%	66,262	26.57%
047	80,757	747	0.93	4.64%	68,384	4.54%
048	79,492	-518	-0.65	4.00%	64,068	4.24%
049	80,609	599	0.75	16.56%	66,373	15.86%
050	80,677	667	0.83	13.11%	55,689	13.32%
051	80,372	362	0.45	15.03%	58,448	14.61%
052	79,290	-720	-0.90	29.05%	56,592	28.81%
053	80,049	39	0.05	5.09%	62,827	4.99%
054	80,155	145	0.18	17.28%	57,249	17.02%
055	79,578	-432	-0.54	15.89%	59,680	16.36%
056	79,271	-739	-0.92	11.80%	58,745	12.72%
057	80,778	768	0.96	16.96%	68,024	15.29%
058	80,767	757	0.95	6.49%	61,395	6.67%
059	79,345	-665	-0.83	19.61%	62,208	19.77%
060	79,219	-791	-0.99	33.40%	62,712	32.17%
061	79,792	-218	-0.27	33.48%	63,280	33.18%
062	79,677	-333	-0.42	24.54%	61,022	23.81%
063	79,602	-408	-0.51	58.79%	61,404	58.55%
064	79,262	-748	-0.93	24.09%	61,722	23.91%
065	79,364	-646	-0.81	13.54%	59,232	14.37%
066	79,397	-613	-0.77	16.74%	58,534	15.58%
067	79,633	-377	-0.47	5.25%	57,154	5.28%
068	79,611	-399	-0.50	7.04%	63,752	6.91%
069	79,386	-624	-0.78	57.17%	62,538	54.20%
070	79,382	-628	-0.78	57.39%	58,654	55.42%
071	80,322	312	0.39	59.17%	66,230	54.44%
072	80,764	754	0.94	13.19%	62,008	12.96%
073	80,135	125	0.16	13.57%	63,116	12.92%
074	79,594	-416	-0.52	59.16%	60,478	56.47%
075	79,295	-715	-0.89	55.57%	63,445	55.10%
076	80,313	303	0.38	25.24%	59,747	24.66%
077	79,627	-383	-0.48	59.84%	57,841	57.92%
078	80,475	465	0.58	16.14%	60,410	16.60%
079	80,243	233	0.29	29.73%	66,796	28.31%
080	80,705	695	0.87	57.70%	60,871	55.48%

081	79,438	-572	-0.71	18.09%	59,833	18.00%
082	80,463	453	0.57	9.15%	63,348	8.48%
083	79,538	-472	-0.59	15.44%	62,818	14.39%
084	80,281	271	0.34	19.49%	58,742	19.43%
085	80,800	790	0.99	19.07%	62,188	18.06%
086	80,747	737	0.92	7.60%	59,286	7.84%
087	79,275	-735	-0.92	7.88%	55,787	8.09%
088	80,191	181	0.23	13.97%	58,354	13.44%
089	79,614	-396	-0.49	56.91%	61,070	54.30%
090	80,425	415	0.52	57.50%	60,204	55.17%
091	79,229	-781	-0.98	19.41%	59,281	18.90%
092	79,689	-321	-0.40	60.33%	61,309	59.28%
093	79,211	-799	-1.00	23.08%	62,539	21.56%
094	79,429	-581	-0.73	21.36%	62,412	20.11%
095	80,071	61	0.08	60.44%	59,017	58.44%
096	79,217	-793	-0.99	13.59%	61,067	13.30%
097	79,386	-624	-0.78	10.47%	60,024	10.65%
098	79,251	-759	-0.95	16.22%	62,740	16.16%
099	80,332	322	0.40	24.46%	63,534	23.71%
100	80,037	27	0.03	28.29%	63,027	26.90%

Total Population: 8,001,024

Ideal District Population: 80,010

Summary Statistics

Population Range: 79,210 to 80,800

Ratio Range: 0.02

Absolute Range: -800 to 790

Absolute Overall Range: 1,590.00

Relative Range: -1.00% to 0.99%

Relative Overall Range: 1.99%

Absolute Mean Deviation: 500.34

Relative Mean Deviation: 0.63%

Standard Deviation: 548.43

Population Summary Report

Thursday April 9, 2015 1:11 PM

Plan: vaLD_DLS-PLAN-2_CURRENT-2010_od09a
Plan Type:
Administrator:
User:

DIST-RICT	POPU-LATION	DEVI-ATION	%DE-VN	[%NHB-POP]	TOT-VAP	[%NHB-VAP]
001	72,324	-7,686	-9.61	3.13%	57,833	3.69%
002	69,063	-10,947	-13.68	2.12%	54,630	2.35%
003	66,212	-13,798	-17.25	2.34%	53,177	2.53%
004	73,375	-6,635	-8.29	2.33%	58,842	2.24%
005	69,572	-10,438	-13.05	2.13%	55,154	2.07%
006	73,250	-6,760	-8.45	4.12%	58,276	4.11%
007	75,999	-4,011	-5.01	4.75%	62,214	4.63%
008	74,460	-5,550	-6.94	5.24%	58,528	4.95%
009	82,064	2,054	2.57	8.79%	65,128	9.00%
010	68,822	-11,188	-13.98	12.80%	54,788	12.73%
011	73,038	-6,972	-8.71	35.02%	56,244	32.92%
012	75,683	-4,327	-5.41	4.33%	64,081	4.26%
013	190,620	110,610	138.25	9.73%	131,503	9.83%
014	64,712	-15,298	-19.12	39.86%	51,053	37.46%
015	78,102	-1,908	-2.38	2.00%	61,155	1.98%
016	70,220	-9,790	-12.24	24.02%	55,023	23.55%
017	73,149	-6,861	-8.58	5.95%	58,033	5.40%
018	82,817	2,807	3.51	5.72%	62,954	5.87%
019	78,345	-1,665	-2.08	5.86%	61,053	5.93%
020	76,800	-3,210	-4.01	6.18%	60,846	6.22%
021	76,066	-3,944	-4.93	23.66%	55,998	22.91%
022	78,106	-1,904	-2.38	11.55%	61,006	11.58%
023	80,898	888	1.11	28.95%	64,845	26.46%
024	72,372	-7,638	-9.55	8.86%	58,206	8.74%
025	83,601	3,591	4.49	5.20%	64,291	5.23%
026	82,704	2,694	3.37	3.88%	67,195	3.69%
027	87,915	7,905	9.88	26.92%	64,804	25.85%
028	94,896	14,886	18.61	17.96%	70,257	17.06%
029	88,049	8,039	10.05	5.84%	66,863	5.59%
030	90,008	9,998	12.50	13.72%	67,963	13.95%
031	88,587	8,577	10.72	22.01%	63,042	21.77%
032	112,677	32,667	40.83	6.90%	78,679	7.13%
033	113,100	33,090	41.36	6.33%	79,525	6.48%
034	74,627	-5,383	-6.73	2.76%	55,355	2.92%
035	87,326	7,316	9.14	4.29%	66,402	4.44%

036	74,325	-5,685	-7.11	7.87%	57,195	7.41%
037	75,246	-4,764	-5.95	5.95%	59,812	6.04%
038	76,948	-3,062	-3.83	10.04%	59,896	9.61%
039	78,182	-1,828	-2.28	6.56%	60,143	6.08%
040	80,835	825	1.03	6.07%	59,244	6.08%
041	70,634	-9,376	-11.72	6.11%	52,989	5.96%
042	81,840	1,830	2.29	14.09%	59,031	13.40%
043	78,088	-1,922	-2.40	15.36%	59,703	14.80%
044	79,883	-127	-0.16	20.98%	59,332	20.57%
045	78,709	-1,301	-1.63	11.16%	65,973	10.54%
046	77,235	-2,775	-3.47	28.49%	64,174	27.38%
047	78,184	-1,826	-2.28	6.78%	65,989	6.54%
048	83,331	3,321	4.15	5.36%	71,185	5.58%
049	68,637	-11,373	-14.21	16.60%	54,485	16.29%
050	82,586	2,576	3.22	13.02%	59,678	13.10%
051	77,333	-2,677	-3.35	20.65%	56,572	20.24%
052	98,234	18,224	22.78	27.46%	69,541	27.14%
053	80,425	415	0.52	4.03%	62,455	3.99%
054	99,135	19,125	23.90	16.00%	70,835	15.80%
055	81,482	1,472	1.84	9.93%	60,698	10.11%
056	95,097	15,087	18.86	13.10%	70,975	13.99%
057	74,900	-5,110	-6.39	16.57%	62,660	14.81%
058	87,462	7,452	9.31	8.19%	67,486	8.43%
059	77,730	-2,280	-2.85	24.65%	61,131	24.51%
060	72,146	-7,864	-9.83	34.39%	57,699	33.35%
061	71,425	-8,585	-10.73	33.58%	56,775	33.09%
062	76,461	-3,549	-4.44	25.64%	58,854	24.79%
063	73,723	-6,287	-7.86	57.42%	58,013	57.29%
064	83,940	3,930	4.91	21.18%	67,121	20.41%
065	89,790	9,780	12.22	9.04%	66,205	9.47%
066	88,542	8,532	10.66	17.12%	65,915	15.94%
067	87,457	7,447	9.31	6.10%	63,998	6.10%
068	73,167	-6,843	-8.55	12.00%	58,611	11.22%
069	71,299	-8,711	-10.89	57.55%	55,216	55.17%
070	79,380	-630	-0.79	63.38%	59,060	60.92%
071	74,194	-5,816	-7.27	49.55%	62,649	45.36%
072	81,778	1,768	2.21	11.14%	62,711	10.88%
073	74,500	-5,510	-6.89	16.55%	59,008	15.89%
074	80,153	143	0.18	64.21%	60,325	61.90%
075	70,454	-9,556	-11.94	55.44%	56,367	55.00%
076	92,939	12,929	16.16	26.19%	69,266	25.66%
077	76,927	-3,083	-3.85	58.15%	56,134	56.79%
078	81,062	1,052	1.31	16.44%	60,892	16.85%
079	73,068	-6,942	-8.68	40.80%	54,594	38.48%
080	70,585	-9,425	-11.78	56.30%	55,645	53.58%
081	74,455	-5,555	-6.94	14.81%	55,612	14.91%

082	70,417	-9,593	-11.99	7.65%	56,016	7.24%
083	73,171	-6,839	-8.55	19.39%	57,417	18.05%
084	77,736	-2,274	-2.84	20.41%	57,150	20.18%
085	74,035	-5,975	-7.47	20.50%	56,846	19.55%
086	89,028	9,018	11.27	9.01%	66,342	9.15%
087	71,505	-8,505	-10.63	24.84%	54,818	22.97%
088	93,126	13,116	16.39	14.18%	66,826	13.88%
089	74,259	-5,751	-7.19	53.96%	56,922	51.31%
090	71,080	-8,930	-11.16	57.96%	52,752	55.61%
091	64,074	-15,936	-19.92	15.79%	49,375	15.34%
092	71,017	-8,993	-11.24	61.70%	54,472	60.55%
093	73,204	-6,806	-8.51	34.18%	55,175	32.06%
094	71,464	-8,546	-10.68	24.94%	55,572	23.27%
095	67,882	-12,128	-15.16	62.22%	51,008	60.50%
096	90,800	10,790	13.49	14.49%	68,293	14.20%
097	87,705	7,695	9.62	17.85%	67,243	18.00%
098	75,266	-4,744	-5.93	15.50%	59,650	15.45%
099	80,416	406	0.51	24.43%	63,601	23.69%
100	71,374	-8,636	-10.79	28.15%	61,071	27.35%

Total Population: 8,001,024

Ideal District Population: 80,010

Summary Statistics

Population Range: 64,074 to 190,620

Ratio Range:1.97

Absolute Range: -15,936 to 110,610

Absolute Overall Range: 126,546.00

Relative Range: -19.92% to 138.25%

Relative Overall Range: 158.16%

Absolute Mean Deviation: 8,040.86

Relative Mean Deviation: 10.05%

Standard Deviation: 14,214.32

Population Summary Report

Thursday April 9, 2015 1:46 PM

Plan: vaLD_DLS-PLAN-3a_PROP-HB5001-Jones_od09a
Plan Type:
Administrator:
User:

DIST-RICT	POPU-LATION	DEVI-ATION	%DE-VN	[%NHB-POP]	TOTVAP	[%NHB-VAP]
001	80,227	217	0.27	3.22%	64,003	3.71%
002	79,235	-775	-0.97	23.41%	55,988	23.09%
003	79,803	-207	-0.26	2.73%	64,131	2.93%
004	80,495	485	0.61	2.80%	63,854	2.89%
005	80,559	549	0.69	1.71%	64,644	1.69%
006	80,661	651	0.81	1.85%	63,854	1.83%
007	80,146	136	0.17	3.85%	64,401	3.79%
008	80,685	675	0.84	3.98%	63,208	3.79%
009	80,574	564	0.70	9.69%	64,142	9.78%
010	80,784	774	0.97	7.98%	57,012	8.13%
011	80,132	122	0.15	32.63%	62,356	30.37%
012	80,492	482	0.60	4.19%	69,034	4.12%
013	80,579	569	0.71	12.47%	58,290	12.42%
014	79,416	-594	-0.74	36.05%	62,243	34.05%
015	80,528	518	0.65	1.80%	62,834	1.74%
016	79,683	-327	-0.41	27.02%	63,222	26.66%
017	80,631	621	0.78	6.30%	63,576	5.82%
018	79,450	-560	-0.70	7.09%	59,686	7.40%
019	80,080	70	0.09	5.74%	62,844	5.74%
020	79,334	-676	-0.84	8.26%	62,717	7.91%
021	79,608	-402	-0.50	23.34%	58,656	22.83%
022	79,307	-703	-0.88	21.34%	61,467	20.20%
023	79,731	-279	-0.35	15.44%	64,320	14.42%
024	79,277	-733	-0.92	8.23%	64,086	8.46%
025	80,551	541	0.68	3.38%	62,073	3.48%
026	80,790	780	0.97	4.08%	65,639	3.90%
027	79,368	-642	-0.80	18.30%	59,138	17.20%
028	79,304	-706	-0.88	18.21%	58,388	17.41%
029	79,474	-536	-0.67	5.82%	61,209	5.62%
030	80,583	573	0.72	14.57%	61,276	14.68%
031	80,414	404	0.50	20.52%	57,646	20.39%
032	80,268	258	0.32	7.12%	55,263	7.42%
033	80,760	750	0.94	4.67%	57,289	4.67%
034	80,722	712	0.89	3.14%	57,978	3.28%

035	80,079	69	0.09	4.52%	62,283	4.60%
036	79,746	-264	-0.33	8.66%	61,859	8.13%
037	80,389	379	0.47	7.58%	63,940	7.52%
038	80,655	645	0.81	9.45%	62,394	8.91%
039	80,770	760	0.95	11.29%	61,474	10.68%
040	80,729	719	0.90	6.12%	58,415	6.15%
041	80,805	795	0.99	5.61%	60,650	5.43%
042	79,964	-46	-0.06	9.84%	58,066	9.27%
043	80,436	426	0.53	15.20%	62,495	14.54%
044	80,365	355	0.44	21.15%	59,264	20.87%
045	80,697	687	0.86	12.28%	67,744	11.67%
046	80,333	323	0.40	27.49%	66,262	26.57%
047	79,451	-559	-0.70	4.85%	67,270	4.76%
048	80,667	657	0.82	4.05%	66,518	4.36%
049	80,798	788	0.98	15.50%	65,025	15.03%
050	80,677	667	0.83	13.11%	55,689	13.32%
051	79,361	-649	-0.81	15.09%	57,711	14.67%
052	79,353	-657	-0.82	27.96%	56,601	27.63%
053	80,309	299	0.37	4.90%	63,038	4.79%
054	80,209	199	0.25	17.26%	57,288	17.01%
055	79,578	-432	-0.54	15.89%	59,680	16.36%
056	79,271	-739	-0.92	11.80%	58,745	12.72%
057	80,698	688	0.86	16.95%	67,910	15.28%
058	80,307	297	0.37	6.48%	61,021	6.65%
059	79,345	-665	-0.83	19.61%	62,208	19.77%
060	79,219	-791	-0.99	33.40%	62,712	32.17%
061	79,223	-787	-0.98	33.49%	63,124	33.41%
062	79,249	-761	-0.95	22.37%	60,977	21.77%
063	79,628	-382	-0.48	58.77%	61,428	58.53%
064	79,358	-652	-0.81	23.97%	61,765	23.86%
065	79,263	-747	-0.93	13.28%	59,022	14.17%
066	79,334	-676	-0.84	16.75%	58,483	15.59%
067	79,633	-377	-0.47	5.25%	57,154	5.28%
068	79,666	-344	-0.43	8.77%	63,749	8.58%
069	79,306	-704	-0.88	58.52%	61,663	55.86%
070	79,769	-241	-0.30	60.31%	59,137	58.01%
071	80,310	300	0.37	57.99%	65,964	53.75%
072	80,509	499	0.62	13.31%	62,060	13.07%
073	80,644	634	0.79	11.03%	63,854	10.43%
074	79,595	-415	-0.52	59.73%	60,498	57.13%
075	79,742	-268	-0.33	55.58%	63,534	54.90%
076	80,313	303	0.38	25.24%	59,747	24.66%
077	79,627	-383	-0.48	59.84%	57,841	57.92%
078	80,543	533	0.67	16.13%	60,478	16.59%
079	80,278	268	0.33	28.92%	67,363	27.48%
080	80,705	695	0.87	57.70%	60,871	55.48%

081	79,370	-640	-0.80	18.10%	59,765	18.02%
082	80,463	453	0.57	9.15%	63,348	8.48%
083	79,538	-472	-0.59	15.44%	62,818	14.39%
084	80,281	271	0.34	19.49%	58,742	19.43%
085	79,836	-174	-0.22	18.80%	61,501	17.82%
086	80,747	737	0.92	7.60%	59,286	7.84%
087	79,275	-735	-0.92	7.88%	55,787	8.09%
088	80,137	127	0.16	13.97%	58,315	13.45%
089	80,784	774	0.97	55.60%	61,863	53.17%
090	80,758	748	0.93	58.66%	60,322	56.39%
091	79,347	-663	-0.83	21.55%	59,295	20.84%
092	79,376	-634	-0.79	61.96%	61,162	61.06%
093	79,453	-557	-0.70	21.63%	62,782	20.26%
094	79,429	-581	-0.73	21.36%	62,412	20.11%
095	79,969	-41	-0.05	58.35%	58,866	56.23%
096	79,272	-738	-0.92	13.58%	61,108	13.29%
097	79,386	-624	-0.78	10.47%	60,024	10.65%
098	79,251	-759	-0.95	16.22%	62,740	16.16%
099	80,332	322	0.40	24.46%	63,534	23.71%
100	79,463	-547	-0.68	28.89%	62,236	27.47%

Total Population: 8,001,024

Ideal District Population: 80,010

Summary Statistics

Population Range: 79,219 to 80,805

Ratio Range:0.02

Absolute Range: -791 to 795

Absolute Overall Range: 1,586.00

Relative Range: -0.99% to 0.99%

Relative Overall Range: 1.98%

Absolute Mean Deviation: 517.12

Relative Mean Deviation: 0.65%

Standard Deviation: 558.26

Population Summary Report

Thursday April 9, 2015 1:56 PM

Plan: vaLD_DLS-PLAN-3b_PROP-HB5001-HseSub_od09a
Plan Type:
Administrator:
User:

DIST-RICT	POPU-LATION	DEVI-ATION	%DE-VN	[%NHB-POP]	TOTVAP	[%NHB-VAP]
001	80,227	217	0.27	3.22%	64,003	3.71%
002	79,235	-775	-0.97	23.41%	55,988	23.09%
003	79,803	-207	-0.26	2.73%	64,131	2.93%
004	80,495	485	0.61	2.80%	63,854	2.89%
005	80,607	597	0.75	1.72%	64,690	1.68%
006	80,613	603	0.75	1.85%	63,808	1.84%
007	80,146	136	0.17	3.85%	64,401	3.79%
008	80,685	675	0.84	3.98%	63,208	3.79%
009	80,574	564	0.70	9.69%	64,142	9.78%
010	80,073	63	0.08	8.01%	56,543	8.16%
011	80,132	122	0.15	32.63%	62,356	30.37%
012	80,492	482	0.60	4.19%	69,034	4.12%
013	80,579	569	0.71	12.47%	58,290	12.42%
014	79,407	-603	-0.75	35.79%	62,379	33.86%
015	80,630	620	0.77	1.80%	62,907	1.74%
016	79,692	-318	-0.40	27.28%	63,086	26.83%
017	80,631	621	0.78	6.30%	63,576	5.82%
018	79,450	-560	-0.70	7.09%	59,686	7.40%
019	80,080	70	0.09	5.74%	62,844	5.74%
020	79,334	-676	-0.84	8.26%	62,717	7.91%
021	79,608	-402	-0.50	23.34%	58,656	22.83%
022	79,307	-703	-0.88	21.34%	61,467	20.20%
023	79,330	-680	-0.85	15.68%	63,982	14.61%
024	79,678	-332	-0.41	8.03%	64,424	8.30%
025	80,551	541	0.68	3.38%	62,073	3.48%
026	80,688	678	0.85	4.08%	65,566	3.90%
027	79,301	-709	-0.89	18.47%	59,103	17.39%
028	79,304	-706	-0.88	18.21%	58,388	17.41%
029	80,185	175	0.22	5.82%	61,678	5.61%
030	80,583	573	0.72	14.57%	61,276	14.68%
031	79,210	-800	-1.00	19.46%	56,743	19.25%
032	80,268	258	0.32	7.12%	55,263	7.42%
033	80,760	750	0.94	4.67%	57,289	4.67%
034	80,722	712	0.89	3.14%	57,978	3.28%

035	80,213	203	0.25	4.57%	62,743	4.70%
036	79,746	-264	-0.33	8.66%	61,859	8.13%
037	80,255	245	0.31	7.54%	63,480	7.44%
038	80,418	408	0.51	9.49%	62,202	8.94%
039	80,799	789	0.99	9.03%	61,944	8.58%
040	80,729	719	0.90	6.12%	58,415	6.15%
041	80,792	782	0.98	5.57%	60,765	5.38%
042	79,964	-46	-0.06	9.84%	58,066	9.27%
043	80,661	651	0.81	17.15%	62,244	16.42%
044	80,796	786	0.98	21.28%	59,112	21.10%
045	80,240	230	0.29	11.42%	67,692	10.85%
046	80,333	323	0.40	27.49%	66,262	26.57%
047	80,757	747	0.93	4.64%	68,384	4.54%
048	79,492	-518	-0.65	4.00%	64,068	4.24%
049	80,672	662	0.83	16.56%	66,414	15.85%
050	80,677	667	0.83	13.11%	55,689	13.32%
051	80,372	362	0.45	15.03%	58,448	14.61%
052	79,546	-464	-0.58	29.13%	56,767	28.89%
053	80,326	316	0.39	5.09%	63,047	4.99%
054	80,209	199	0.25	17.26%	57,288	17.01%
055	79,578	-432	-0.54	15.89%	59,680	16.36%
056	79,271	-739	-0.92	11.80%	58,745	12.72%
057	80,698	688	0.86	16.95%	67,910	15.28%
058	80,307	297	0.37	6.48%	61,021	6.65%
059	79,345	-665	-0.83	19.61%	62,208	19.77%
060	79,219	-791	-0.99	33.40%	62,712	32.17%
061	79,792	-218	-0.27	33.48%	63,280	33.18%
062	79,509	-501	-0.63	23.66%	61,088	22.94%
063	79,602	-408	-0.51	58.79%	61,404	58.55%
064	79,350	-660	-0.82	24.16%	61,811	23.98%
065	79,263	-747	-0.93	13.28%	59,022	14.17%
066	79,334	-676	-0.84	16.75%	58,483	15.59%
067	79,633	-377	-0.47	5.25%	57,154	5.28%
068	80,651	641	0.80	7.15%	64,630	7.04%
069	79,305	-705	-0.88	57.54%	62,448	54.54%
070	79,384	-626	-0.78	58.59%	58,447	56.76%
071	79,773	-237	-0.30	59.54%	65,722	54.82%
072	80,764	754	0.94	13.19%	62,008	12.96%
073	80,135	125	0.16	13.57%	63,116	12.92%
074	79,594	-416	-0.52	59.16%	60,478	56.47%
075	79,207	-803	-1.00	55.54%	63,356	55.07%
076	80,313	303	0.38	25.24%	59,747	24.66%
077	79,627	-383	-0.48	59.84%	57,841	57.92%
078	80,475	465	0.58	16.14%	60,410	16.60%
079	80,278	268	0.33	28.92%	67,363	27.48%
080	80,705	695	0.87	57.70%	60,871	55.48%

081	79,438	-572	-0.71	18.09%	59,833	18.00%
082	80,463	453	0.57	9.15%	63,348	8.48%
083	79,538	-472	-0.59	15.44%	62,818	14.39%
084	80,281	271	0.34	19.49%	58,742	19.43%
085	80,800	790	0.99	19.07%	62,188	18.06%
086	80,747	737	0.92	7.60%	59,286	7.84%
087	79,275	-735	-0.92	7.88%	55,787	8.09%
088	80,137	127	0.16	13.97%	58,315	13.45%
089	79,784	-226	-0.28	56.77%	61,032	54.35%
090	80,794	784	0.98	57.67%	60,466	55.35%
091	79,426	-584	-0.73	19.68%	59,393	19.16%
092	79,269	-741	-0.93	60.33%	61,014	59.28%
093	79,218	-792	-0.99	22.99%	62,565	21.47%
094	79,429	-581	-0.73	21.36%	62,412	20.11%
095	80,232	222	0.28	60.41%	59,133	58.42%
096	79,272	-738	-0.92	13.58%	61,108	13.29%
097	79,386	-624	-0.78	10.47%	60,024	10.65%
098	79,251	-759	-0.95	16.22%	62,740	16.16%
099	80,332	322	0.40	24.46%	63,534	23.71%
100	79,463	-547	-0.68	28.89%	62,236	27.47%

Total Population: 8,001,024

Ideal District Population: 80,010

Summary Statistics

Population Range: 79,207 to 80,800

Ratio Range:0.02

Absolute Range: -803 to 790

Absolute Overall Range: 1,593.00

Relative Range: -1.00% to 0.99%

Relative Overall Range: 1.99%

Absolute Mean Deviation: 510.60

Relative Mean Deviation: 0.64%

Standard Deviation: 555.40

Population Summary Report

Thursday April 9, 2015 2:04 PM

Plan: vaLD_DLS-PLAN-3c_PROP-HB5001-SenSub_od09a
Plan Type:
Administrator:
User:

DIST-RICT	POPU-LATION	DEVI-ATION	%DE-VN	[%NHB-POP]	TOTVAP	[%NHB-VAP]
001	80,508	498	0.62	3.21%	64,221	3.70%
002	79,235	-775	-0.97	23.41%	55,988	23.09%
003	80,583	573	0.72	2.71%	64,745	2.91%
004	80,446	436	0.54	1.84%	64,195	2.05%
005	80,600	590	0.74	2.69%	64,337	2.54%
006	79,608	-402	-0.50	1.85%	62,988	1.84%
007	80,146	136	0.17	3.85%	64,401	3.79%
008	80,685	675	0.84	3.98%	63,208	3.79%
009	80,574	564	0.70	9.69%	64,142	9.78%
010	80,073	63	0.08	8.01%	56,543	8.16%
011	80,132	122	0.15	32.63%	62,356	30.37%
012	80,492	482	0.60	4.19%	69,034	4.12%
013	80,579	569	0.71	12.47%	58,290	12.42%
014	79,407	-603	-0.75	35.79%	62,379	33.86%
015	80,630	620	0.77	1.80%	62,907	1.74%
016	79,692	-318	-0.40	27.28%	63,086	26.83%
017	80,631	621	0.78	6.30%	63,576	5.82%
018	79,450	-560	-0.70	7.09%	59,686	7.40%
019	80,006	-4	0.00	5.72%	62,811	5.73%
020	79,334	-676	-0.84	8.26%	62,717	7.91%
021	79,608	-402	-0.50	23.34%	58,656	22.83%
022	79,307	-703	-0.88	21.34%	61,467	20.20%
023	79,404	-606	-0.76	15.69%	64,015	14.61%
024	79,678	-332	-0.41	8.03%	64,424	8.30%
025	80,011	1	0.00	3.33%	61,585	3.42%
026	80,688	678	0.85	4.08%	65,566	3.90%
027	79,301	-709	-0.89	18.47%	59,103	17.39%
028	79,304	-706	-0.88	18.21%	58,388	17.41%
029	80,185	175	0.22	5.82%	61,678	5.61%
030	80,583	573	0.72	14.57%	61,276	14.68%
031	79,210	-800	-1.00	19.46%	56,743	19.25%
032	80,268	258	0.32	7.12%	55,263	7.42%
033	80,760	750	0.94	4.67%	57,289	4.67%
034	80,722	712	0.89	3.14%	57,978	3.28%

035	80,213	203	0.25	4.57%	62,743	4.70%
036	79,746	-264	-0.33	8.66%	61,859	8.13%
037	80,255	245	0.31	7.54%	63,480	7.44%
038	80,758	748	0.93	9.47%	62,463	8.92%
039	80,710	700	0.87	9.15%	61,870	8.64%
040	80,729	719	0.90	6.12%	58,415	6.15%
041	80,792	782	0.98	5.57%	60,765	5.38%
042	79,964	-46	-0.06	9.84%	58,066	9.27%
043	80,750	740	0.92	17.03%	62,318	16.34%
044	80,796	786	0.98	21.28%	59,112	21.10%
045	80,240	230	0.29	11.42%	67,692	10.85%
046	80,333	323	0.40	27.49%	66,262	26.57%
047	80,757	747	0.93	4.64%	68,384	4.54%
048	79,492	-518	-0.65	4.00%	64,068	4.24%
049	80,609	599	0.75	16.56%	66,373	15.86%
050	80,677	667	0.83	13.11%	55,689	13.32%
051	80,372	362	0.45	15.03%	58,448	14.61%
052	79,546	-464	-0.58	29.13%	56,767	28.89%
053	80,049	39	0.05	5.09%	62,827	4.99%
054	80,155	145	0.18	17.28%	57,249	17.02%
055	79,578	-432	-0.54	15.89%	59,680	16.36%
056	79,271	-739	-0.92	11.80%	58,745	12.72%
057	80,740	730	0.91	16.90%	67,972	15.24%
058	80,307	297	0.37	6.48%	61,021	6.65%
059	79,843	-167	-0.21	19.61%	62,634	19.75%
060	79,219	-791	-0.99	33.40%	62,712	32.17%
061	79,792	-218	-0.27	33.48%	63,280	33.18%
062	79,509	-501	-0.63	23.66%	61,088	22.94%
063	79,602	-408	-0.51	58.79%	61,404	58.55%
064	79,262	-748	-0.93	24.09%	61,722	23.91%
065	79,263	-747	-0.93	13.28%	59,022	14.17%
066	79,334	-676	-0.84	16.75%	58,483	15.59%
067	79,633	-377	-0.47	5.25%	57,154	5.28%
068	80,651	641	0.80	7.15%	64,630	7.04%
069	79,237	-773	-0.97	58.05%	62,252	55.11%
070	79,989	-21	-0.03	58.99%	58,917	57.18%
071	79,236	-774	-0.97	58.62%	65,448	53.88%
072	80,764	754	0.94	13.19%	62,008	12.96%
073	80,135	125	0.16	13.57%	63,116	12.92%
074	79,594	-416	-0.52	59.16%	60,478	56.47%
075	79,295	-715	-0.89	55.57%	63,445	55.10%
076	80,313	303	0.38	25.24%	59,747	24.66%
077	79,627	-383	-0.48	59.84%	57,841	57.92%
078	80,475	465	0.58	16.14%	60,410	16.60%
079	80,243	233	0.29	29.73%	66,796	28.31%
080	80,705	695	0.87	57.70%	60,871	55.48%

081	79,438	-572	-0.71	18.09%	59,833	18.00%
082	80,463	453	0.57	9.15%	63,348	8.48%
083	79,538	-472	-0.59	15.44%	62,818	14.39%
084	80,281	271	0.34	19.49%	58,742	19.43%
085	80,800	790	0.99	19.07%	62,188	18.06%
086	80,747	737	0.92	7.60%	59,286	7.84%
087	79,275	-735	-0.92	7.88%	55,787	8.09%
088	80,191	181	0.23	13.97%	58,354	13.44%
089	80,520	510	0.64	57.35%	61,584	54.65%
090	79,519	-491	-0.61	57.07%	59,690	54.82%
091	79,229	-781	-0.98	19.41%	59,281	18.90%
092	79,689	-321	-0.40	60.33%	61,309	59.28%
093	79,211	-799	-1.00	23.08%	62,539	21.56%
094	79,429	-581	-0.73	21.36%	62,412	20.11%
095	80,071	61	0.08	60.44%	59,017	58.44%
096	79,217	-793	-0.99	13.59%	61,067	13.30%
097	79,386	-624	-0.78	10.47%	60,024	10.65%
098	79,251	-759	-0.95	16.22%	62,740	16.16%
099	80,332	322	0.40	24.46%	63,534	23.71%
100	80,037	27	0.03	28.29%	63,027	26.90%

Total Population: 8,001,024

Ideal District Population: 80,010

Summary Statistics

Population Range: 79,210 to 80,800

Ratio Range: 0.02

Absolute Range: -800 to 790

Absolute Overall Range: 1,590.00

Relative Range: -1.00% to 0.99%

Relative Overall Range: 1.99%

Absolute Mean Deviation: 494.28

Relative Mean Deviation: 0.62%

Standard Deviation: 549.27

Population Summary Report

Thursday April 9, 2015 2:10PM

Plan: vaLD_DLS-PLAN-3d_PROP-HB5001-PassedSen_od09a
Plan Type:
Administrator:
User:

DIST-RICT	POPU-LATION	DEVI-ATION	%DE-VN	[%NHB-POP]	TOTVAP	[%NHB-VAP]
001	80,508	498	0.62	3.21%	64,221	3.70%
002	79,235	-775	-0.97	23.41%	55,988	23.09%
003	80,583	573	0.72	2.71%	64,745	2.91%
004	80,446	436	0.54	1.84%	64,195	2.05%
005	80,600	590	0.74	2.69%	64,337	2.54%
006	79,608	-402	-0.50	1.85%	62,988	1.84%
007	80,146	136	0.17	3.85%	64,401	3.79%
008	80,685	675	0.84	3.98%	63,208	3.79%
009	80,574	564	0.70	9.69%	64,142	9.78%
010	80,073	63	0.08	8.01%	56,543	8.16%
011	80,132	122	0.15	32.63%	62,356	30.37%
012	80,492	482	0.60	4.19%	69,034	4.12%
013	80,579	569	0.71	12.47%	58,290	12.42%
014	79,407	-603	-0.75	35.79%	62,379	33.86%
015	80,630	620	0.77	1.80%	62,907	1.74%
016	79,692	-318	-0.40	27.28%	63,086	26.83%
017	80,631	621	0.78	6.30%	63,576	5.82%
018	79,450	-560	-0.70	7.09%	59,686	7.40%
019	80,006	-4	0.00	5.72%	62,811	5.73%
020	79,334	-676	-0.84	8.26%	62,717	7.91%
021	79,608	-402	-0.50	23.34%	58,656	22.83%
022	79,307	-703	-0.88	21.34%	61,467	20.20%
023	79,404	-606	-0.76	15.69%	64,015	14.61%
024	79,678	-332	-0.41	8.03%	64,424	8.30%
025	80,011	1	0.00	3.33%	61,585	3.42%
026	80,688	678	0.85	4.08%	65,566	3.90%
027	79,301	-709	-0.89	18.47%	59,103	17.39%
028	79,304	-706	-0.88	18.21%	58,388	17.41%
029	80,185	175	0.22	5.82%	61,678	5.61%
030	80,583	573	0.72	14.57%	61,276	14.68%
031	79,210	-800	-1.00	19.46%	56,743	19.25%
032	80,268	258	0.32	7.12%	55,263	7.42%
033	80,760	750	0.94	4.67%	57,289	4.67%
034	80,722	712	0.89	3.14%	57,978	3.28%

035	80,213	203	0.25	4.57%	62,743	4.70%
036	79,746	-264	-0.33	8.66%	61,859	8.13%
037	80,255	245	0.31	7.54%	63,480	7.44%
038	80,758	748	0.93	9.47%	62,463	8.92%
039	80,710	700	0.87	9.15%	61,870	8.64%
040	80,729	719	0.90	6.12%	58,415	6.15%
041	80,792	782	0.98	5.57%	60,765	5.38%
042	79,964	-46	-0.06	9.84%	58,066	9.27%
043	80,750	740	0.92	17.03%	62,318	16.34%
044	80,796	786	0.98	21.28%	59,112	21.10%
045	80,240	230	0.29	11.42%	67,692	10.85%
046	80,333	323	0.40	27.49%	66,262	26.57%
047	80,757	747	0.93	4.64%	68,384	4.54%
048	79,492	-518	-0.65	4.00%	64,068	4.24%
049	80,609	599	0.75	16.56%	66,373	15.86%
050	80,677	667	0.83	13.11%	55,689	13.32%
051	80,372	362	0.45	15.03%	58,448	14.61%
052	79,546	-464	-0.58	29.13%	56,767	28.89%
053	80,049	39	0.05	5.09%	62,827	4.99%
054	80,155	145	0.18	17.28%	57,249	17.02%
055	79,578	-432	-0.54	15.89%	59,680	16.36%
056	79,271	-739	-0.92	11.80%	58,745	12.72%
057	80,740	730	0.91	16.90%	67,972	15.24%
058	80,307	297	0.37	6.48%	61,021	6.65%
059	79,843	-167	-0.21	19.61%	62,634	19.75%
060	79,219	-791	-0.99	33.40%	62,712	32.17%
061	79,792	-218	-0.27	33.48%	63,280	33.18%
062	79,509	-501	-0.63	23.66%	61,088	22.94%
063	79,602	-408	-0.51	58.79%	61,404	58.55%
064	79,262	-748	-0.93	24.09%	61,722	23.91%
065	79,263	-747	-0.93	13.28%	59,022	14.17%
066	79,334	-676	-0.84	16.75%	58,483	15.59%
067	79,633	-377	-0.47	5.25%	57,154	5.28%
068	80,651	641	0.80	7.15%	64,630	7.04%
069	79,305	-705	-0.88	57.54%	62,448	54.54%
070	79,384	-626	-0.78	58.59%	58,447	56.76%
071	79,773	-237	-0.30	59.54%	65,722	54.82%
072	80,764	754	0.94	13.19%	62,008	12.96%
073	80,135	125	0.16	13.57%	63,116	12.92%
074	79,594	-416	-0.52	59.16%	60,478	56.47%
075	79,295	-715	-0.89	55.57%	63,445	55.10%
076	80,313	303	0.38	25.24%	59,747	24.66%
077	79,627	-383	-0.48	59.84%	57,841	57.92%
078	80,475	465	0.58	16.14%	60,410	16.60%
079	80,243	233	0.29	29.73%	66,796	28.31%
080	80,705	695	0.87	57.70%	60,871	55.48%

081	79,438	-572	-0.71	18.09%	59,833	18.00%
082	80,463	453	0.57	9.15%	63,348	8.48%
083	79,538	-472	-0.59	15.44%	62,818	14.39%
084	80,281	271	0.34	19.49%	58,742	19.43%
085	80,800	790	0.99	19.07%	62,188	18.06%
086	80,747	737	0.92	7.60%	59,286	7.84%
087	79,275	-735	-0.92	7.88%	55,787	8.09%
088	80,191	181	0.23	13.97%	58,354	13.44%
089	80,520	510	0.64	57.35%	61,584	54.65%
090	79,519	-491	-0.61	57.07%	59,690	54.82%
091	79,229	-781	-0.98	19.41%	59,281	18.90%
092	79,689	-321	-0.40	60.33%	61,309	59.28%
093	79,211	-799	-1.00	23.08%	62,539	21.56%
094	79,429	-581	-0.73	21.36%	62,412	20.11%
095	80,071	61	0.08	60.44%	59,017	58.44%
096	79,217	-793	-0.99	13.59%	61,067	13.30%
097	79,386	-624	-0.78	10.47%	60,024	10.65%
098	79,251	-759	-0.95	16.22%	62,740	16.16%
099	80,332	322	0.40	24.46%	63,534	23.71%
100	80,037	27	0.03	28.29%	63,027	26.90%

Total Population: 8,001,024

Ideal District Population: 80,010

Summary Statistics

Population Range: 79,210 to 80,800

Ratio Range: 0.02

Absolute Range: -800 to 790

Absolute Overall Range: 1,590.00

Relative Range: -1.00% to 0.99%

Relative Overall Range: 1.99%

Absolute Mean Deviation: 494.28

Relative Mean Deviation: 0.62%

Standard Deviation: 546.97

Population Summary Report

Thursday April 9, 2015 2:25 PM

Plan: vaLD_DLS-PLAN-4_PROP-HB5002-Brink-UofR_od09a
Plan Type:
Administrator:
User:

DISTRICT	POPULATION	DEVIATION	%DEVN	[%NHB-POP]	TOTVAP	[%NHB-VAP]
001	81,019	1,009	1.26	3.74%	64,605	4.36%
002	82,053	2,043	2.55	1.55%	65,603	1.69%
003	81,137	1,127	1.41	2.92%	64,632	3.03%
004	81,101	1,091	1.36	2.16%	64,886	2.07%
005	79,111	-899	-1.12	2.02%	62,881	1.97%
006	81,623	1,613	2.02	4.16%	66,033	4.14%
007	80,602	592	0.74	4.21%	68,585	4.04%
008	80,345	335	0.42	4.99%	63,108	4.72%
009	79,422	-588	-0.73	7.20%	62,918	7.33%
010	81,034	1,024	1.28	23.30%	64,430	22.75%
011	80,956	946	1.18	31.29%	63,684	29.02%
012	81,393	1,383	1.73	7.36%	65,248	7.39%
013	76,926	-3,084	-3.85	10.96%	55,452	11.00%
014	80,546	536	0.67	34.61%	62,771	32.92%
015	80,771	761	0.95	3.73%	62,127	3.75%
016	78,882	-1,128	-1.41	11.19%	61,490	11.16%
017	81,898	1,888	2.36	5.89%	63,739	5.26%
018	79,430	-580	-0.72	6.24%	59,487	6.61%
019	81,180	1,170	1.46	4.48%	64,821	4.58%
020	78,943	-1,067	-1.33	4.29%	64,477	4.06%
021	83,279	3,269	4.09	21.34%	62,487	20.74%
022	79,274	-736	-0.92	28.75%	62,889	27.99%
023	80,010	0	0.00	28.22%	64,290	25.69%
024	78,906	-1,104	-1.38	14.18%	61,922	14.41%
025	80,030	20	0.02	4.87%	61,764	4.81%
026	79,121	-889	-1.11	1.59%	61,111	1.54%
027	80,160	150	0.19	26.11%	59,880	24.78%
028	81,471	1,461	1.83	16.55%	61,236	15.35%
029	80,348	338	0.42	5.99%	60,614	5.70%
030	80,650	640	0.80	11.53%	59,191	11.56%
031	77,794	-2,216	-2.77	30.07%	55,235	29.37%
032	78,459	-1,551	-1.94	7.81%	55,327	8.00%
033	79,718	-292	-0.36	6.95%	55,412	7.02%
034	80,795	785	0.98	4.11%	57,684	4.29%

035	80,422	412	0.51	3.16%	60,022	3.35%
036	76,153	-3,857	-4.82	7.84%	58,512	7.39%
037	80,046	36	0.04	6.56%	64,041	6.59%
038	82,832	2,822	3.53	9.58%	64,607	9.17%
039	78,182	-1,828	-2.28	6.56%	60,143	6.08%
040	77,754	-2,256	-2.82	7.06%	57,223	6.97%
041	79,261	-749	-0.94	6.10%	59,739	5.82%
042	77,186	-2,824	-3.53	16.33%	55,185	15.74%
043	79,027	-983	-1.23	14.31%	61,623	13.76%
044	82,505	2,495	3.12	20.30%	61,095	19.93%
045	80,313	303	0.38	12.37%	67,622	11.71%
046	77,836	-2,174	-2.72	28.22%	63,777	27.17%
047	79,371	-639	-0.80	5.38%	67,394	5.21%
048	76,919	-3,091	-3.86	3.65%	61,270	3.89%
049	80,140	130	0.16	15.25%	67,005	14.81%
050	77,884	-2,126	-2.66	9.69%	57,124	9.67%
051	78,639	-1,371	-1.71	21.49%	56,436	21.16%
052	78,056	-1,954	-2.44	25.12%	56,603	24.80%
053	80,000	-10	-0.01	4.44%	63,033	4.37%
054	78,503	-1,507	-1.88	16.62%	55,586	16.38%
055	78,812	-1,198	-1.50	9.82%	59,208	10.05%
056	79,627	-383	-0.48	22.23%	62,523	23.15%
057	79,859	-151	-0.19	15.88%	67,117	14.21%
058	81,991	1,981	2.48	9.49%	62,657	9.77%
059	78,769	-1,241	-1.55	15.36%	60,603	15.73%
060	80,894	884	1.10	33.94%	64,601	33.20%
061	80,414	404	0.50	50.25%	64,064	49.46%
062	82,068	2,058	2.57	33.92%	63,173	32.36%
063	80,025	15	0.02	50.63%	62,864	50.15%
064	79,646	-364	-0.45	11.42%	64,376	10.95%
065	80,580	570	0.71	11.07%	58,171	10.86%
066	81,155	1,145	1.43	19.51%	60,237	18.66%
067	76,019	-3,991	-4.99	6.00%	55,373	6.10%
068	81,708	1,698	2.12	10.53%	62,859	10.11%
069	82,640	2,630	3.29	54.64%	63,117	52.70%
070	80,243	233	0.29	57.82%	59,887	54.61%
071	80,522	512	0.64	53.08%	68,519	48.57%
072	80,105	95	0.12	8.40%	58,192	8.80%
073	80,270	260	0.32	14.33%	64,576	13.68%
074	79,774	-236	-0.29	51.65%	60,905	49.22%
075	78,675	-1,335	-1.67	31.58%	61,698	31.93%
076	78,765	-1,245	-1.56	51.83%	58,594	51.01%
077	79,695	-315	-0.39	52.62%	59,612	49.70%
078	82,800	2,790	3.49	14.05%	60,623	14.43%
079	82,401	2,391	2.99	34.29%	61,277	32.69%
080	81,771	1,761	2.20	42.40%	61,247	41.07%

081	83,677	3,667	4.58	13.09%	61,694	14.16%
082	79,539	-471	-0.59	9.16%	63,166	8.38%
083	80,597	587	0.73	15.11%	63,245	14.21%
084	78,591	-1,419	-1.77	26.55%	58,218	25.05%
085	76,503	-3,507	-4.38	12.20%	51,484	12.37%
086	81,872	1,862	2.33	9.39%	61,234	9.51%
087	80,537	527	0.66	26.39%	66,736	25.24%
088	82,223	2,213	2.77	17.90%	57,629	18.00%
089	83,881	3,871	4.84	50.58%	63,777	48.59%
090	79,508	-502	-0.63	51.60%	62,256	48.32%
091	77,182	-2,828	-3.53	25.53%	58,530	25.05%
092	80,255	245	0.31	50.09%	61,429	49.01%
093	79,654	-356	-0.44	6.92%	53,944	7.08%
094	78,555	-1,455	-1.82	30.38%	59,821	28.13%
095	80,613	603	0.75	56.74%	61,009	55.00%
096	80,595	585	0.73	23.89%	60,460	23.15%
097	79,905	-105	-0.13	17.82%	60,067	18.36%
098	79,629	-381	-0.48	16.63%	63,186	16.53%
099	81,014	1,004	1.25	23.38%	63,778	22.72%
100	78,050	-1,960	-2.45	26.17%	61,552	25.04%

Total Population: 8,001,024

Ideal District Population: 80,010

Summary Statistics

Population Range: 76,019 to 83,881

Ratio Range: 0.100%

Absolute Range: -3,991 to 3,871

Absolute Overall Range: 7,862.00

Relative Range: -4.99% to 4.84%

Relative Overall Range: 9.83%

Absolute Mean Deviation: 1,259.16

Relative Mean Deviation: 1.57%

Standard Deviation: 1,614.38

Population Summary Report

Thursday April 9, 2015 2:31 PM

Plan: vaLD_DLS-PLAN-5_PROP-HB5003-Morrissey_od09a
Plan Type:
Administrator:
User:

DIST-RICT	POPU-LATION	DEVI-ATION	%DE-VN	[%NHB-POP]	TOTVAP	[%NHB-VAP]
001	79,319	-691	-0.86	3.48%	63,175	4.02%
002	83,753	3,743	4.68	1.84%	67,033	2.06%
003	82,795	2,785	3.48	2.73%	67,034	2.89%
004	80,912	902	1.13	2.16%	64,751	2.08%
005	78,872	-1,138	-1.42	2.67%	62,590	2.59%
006	78,270	-1,740	-2.17	4.06%	63,767	4.03%
007	80,782	772	0.96	3.95%	67,288	3.81%
008	81,055	1,045	1.31	5.30%	63,985	4.99%
009	78,880	-1,130	-1.41	7.93%	62,327	8.11%
010	81,465	1,455	1.82	21.30%	64,958	20.69%
011	76,957	-3,053	-3.82	33.86%	59,599	31.63%
012	76,234	-3,776	-4.72	4.67%	60,531	4.97%
013	81,966	1,956	2.44	6.93%	53,653	7.38%
014	80,302	292	0.36	35.60%	62,624	33.87%
015	79,568	-442	-0.55	3.03%	61,259	2.99%
016	78,656	-1,354	-1.69	17.94%	61,950	17.96%
017	76,278	-3,732	-4.66	4.82%	59,988	4.44%
018	81,946	1,936	2.42	8.59%	60,075	8.68%
019	79,238	-772	-0.96	6.87%	61,833	6.96%
020	80,224	214	0.27	5.73%	64,218	5.55%
021	83,021	3,011	3.76	18.16%	59,425	17.68%
022	78,286	-1,724	-2.15	7.88%	56,721	7.93%
023	81,802	1,792	2.24	28.36%	65,703	25.78%
024	79,004	-1,006	-1.26	10.66%	63,424	10.66%
025	76,552	-3,458	-4.32	4.71%	59,225	4.75%
026	81,561	1,551	1.94	3.59%	64,843	3.46%
027	81,027	1,017	1.27	28.52%	60,862	27.01%
028	82,383	2,373	2.97	18.06%	60,894	17.06%
029	79,606	-404	-0.50	5.88%	60,975	5.65%
030	82,994	2,984	3.73	13.93%	62,478	14.13%
031	82,002	1,992	2.49	22.47%	58,378	22.48%
032	81,668	1,658	2.07	7.54%	55,962	7.71%
033	76,518	-3,492	-4.36	4.64%	55,145	4.80%
034	81,806	1,796	2.24	2.96%	60,313	3.12%

035	78,790	-1,220	-1.52	3.91%	59,624	4.07%
036	76,153	-3,857	-4.82	7.84%	58,512	7.39%
037	76,571	-3,439	-4.30	6.00%	60,911	6.11%
038	78,917	-1,093	-1.37	9.72%	61,306	9.29%
039	77,823	-2,187	-2.73	6.32%	59,678	5.88%
040	76,622	-3,388	-4.23	6.28%	56,014	6.28%
U41	78,225	-1,785	-2.23	5.95%	58,806	5.80%
042	81,840	1,830	2.29	14.09%	59,031	13.40%
043	78,088	-1,922	-2.40	15.36%	59,703	14.80%
044	79,883	-127	-0.16	20.98%	59,332	20.57%
045	78,709	-1,301	-1.63	11.16%	65,973	10.54%
046	77,235	-2,775	-3.47	28.49%	64,174	27.38%
047	78,184	-1,826	-2.28	6.78%	65,989	6.54%
048	83,331	3,321	4.15	5.36%	71,185	5.58%
049	78,871	-1,139	-1.42	15.37%	62,594	15.08%
050	82,586	2,576	3.22	13.02%	59,678	13.10%
051	83,623	3,613	4.52	19.32%	61,167	18.88%
052	81,592	1,582	1.98	31.20%	57,330	30.71%
053	77,965	-2,045	-2.56	4.04%	60,437	4.03%
054	82,824	2,814	3.52	18.57%	60,957	18.81%
055	79,012	-998	-1.25	9.80%	59,302	9.92%
056	81,210	1,200	1.50	13.56%	60,337	14.68%
057	76,557	-3,453	-4.32	7.54%	60,390	7.29%
058	77,164	-2,846	-3.56	15.54%	62,815	14.24%
059	82,463	2,453	3.07	21.41%	65,192	21.70%
060	79,918	-92	-0.11	32.18%	62,653	31.07%
061	82,728	2,718	3.40	33.05%	65,779	32.97%
062	80,391	381	0.48	32.02%	61,467	31.28%
063	79,996	-14	-0.02	53.98%	62,856	53.78%
064	80,520	510	0.64	18.50%	64,687	17.79%
065	83,186	3,176	3.97	9.18%	61,215	9.68%
066	82,585	2,575	3.22	16.42%	60,413	15.44%
067	77,656	-2,354	-2.94	6.47%	57,930	6.38%
068	81,345	1,335	1.67	11.94%	65,251	11.25%
069	77,534	-2,476	-3.09	54.33%	59,970	52.06%
070	79,380	-630	-0.79	63.38%	59,060	60.92%
071	76,707	-3,303	-4.13	50.88%	64,596	46.70%
072	83,135	3,125	3.91	10.95%	64,102	10.74%
073	81,362	1,352	1.69	16.29%	63,372	15.67%
074	81,120	1,110	1.39	55.12%	61,607	52.13%
075	77,121	-2,889	-3.61	51.21%	61,652	50.79%
076	79,435	-575	-0.72	32.51%	59,368	31.18%
077	79,765	-245	-0.31	45.00%	58,996	43.47%
078	78,523	-1,487	-1.86	15.72%	58,182	16.70%
079	78,149	-1,861	-2.33	37.89%	59,452	35.90%
080	80,239	229	0.29	61.73%	61,433	58.49%

081	83,069	3,059	3.82	12.36%	62,896	12.09%
082	80,363	353	0.44	22.00%	61,378	20.81%
083	83,149	3,139	3.92	13.99%	64,823	13.19%
084	82,041	2,031	2.54	23.84%	60,058	23.71%
085	83,127	3,117	3.90	22.44%	62,446	21.74%
086	80,356	346	0.43	9.37%	60,067	9.49%
087	82,923	2,913	3.64	23.17%	68,596	22.02%
088	81,877	1,867	2.33	12.34%	58,674	12.24%
089	81,392	1,382	1.73	51.15%	62,592	49.40%
090	79,518	-492	-0.61	54.13%	59,183	51.92%
091	76,459	-3,551	-4.44	11.91%	52,465	11.92%
092	78,747	-1,263	-1.58	54.51%	60,992	53.25%
093	78,365	-1,645	-2.06	12.48%	58,264	12.45%
094	82,137	2,127	2.66	29.53%	62,719	27.36%
095	79,044	-966	-1.21	60.33%	59,312	58.56%
096	79,796	-214	-0.27	29.58%	61,095	28.04%
097	83,233	3,223	4.03	13.33%	63,677	13.45%
098	79,629	-381	-0.48	16.63%	63,186	16.53%
099	78,078	-1,932	-2.41	24.43%	61,730	23.71%
100	76,986	-3,024	-3.78	20.54%	61,730	19.62%

Total Population: 8,001,024

Ideal District Population: 80,010

Summary Statistics

Population Range: 76,153 to 83,753

Ratio Range: 0.10

Absolute Range: -3,857 to 3,743

Absolute Overall Range: 7,600.00

Relative Range: -4.82% to 4.68%

Relative Overall Range: 9.50%

Absolute Mean Deviation: 1,854.38

Relative Mean Deviation: 2.32%

Standard Deviation: 2,150.17

Population Summary Report

Thursday April 9, 2015 2:39 PM

Plan: vaLD_DLS-PLAN-6a_PROP-HB5005-Jones_od09a
Plan Type:
Administrator:
User:

DIST-RICT	POPU-LATION	DEVI-ATION	%DE-VN	[%NHB-POP]	TOTVAP	[%NHB-VAP]
001	80,508	498	0.62	3.21%	64,221	3.70%
002	79,491	-519	-0.65	23.50%	56,163	23.19%
003	80,583	573	0.72	2.71%	64,745	2.91%
004	80,446	436	0.54	1.84%	64,195	2.05%
005	80,600	590	0.74	2.69%	64,337	2.54%
006	79,608	-402	-0.50	1.85%	62,988	1.84%
007	80,146	136	0.17	3.85%	64,401	3.79%
008	80,685	675	0.84	3.98%	63,208	3.79%
009	80,574	564	0.70	9.69%	64,142	9.78%
010	80,073	63	0.08	8.01%	56,543	8.16%
011	80,132	122	0.15	32.63%	62,356	30.37%
012	80,492	482	0.60	4.19%	69,034	4.12%
013	80,579	569	0.71	12.47%	58,290	12.42%
014	79,407	-603	-0.75	35.79%	62,379	33.86%
015	80,630	620	0.77	1.80%	62,907	1.74%
016	79,692	-318	-0.40	27.28%	63,086	26.83%
017	80,631	621	0.78	6.30%	63,576	5.82%
018	79,450	-560	-0.70	7.09%	59,686	7.40%
019	80,080	70	0.09	5.74%	62,844	5.74%
020	79,334	-676	-0.84	8.26%	62,717	7.91%
021	79,608	-402	-0.50	23.34%	58,656	22.83%
022	79,307	-703	-0.88	21.34%	61,467	20.20%
023	79,330	-680	-0.85	15.68%	63,982	14.61%
024	79,678	-332	-0.41	8.03%	64,424	8.30%
025	80,011	1	0.00	3.33%	61,585	3.42%
026	80,688	678	0.85	4.08%	65,566	3.90%
027	79,381	-629	-0.79	18.91%	58,981	17.89%
028	79,304	-706	-0.88	18.21%	58,388	17.41%
029	80,185	175	0.22	5.82%	61,678	5.61%
030	80,583	573	0.72	14.57%	61,276	14.68%
031	79,210	-800	-1.00	19.46%	56,743	19.25%
032	80,268	258	0.32	7.12%	55,263	7.42%
033	80,760	750	0.94	4.67%	57,289	4.67%
034	80,722	712	0.89	3.14%	57,978	3.28%
035	80,213	203	0.25	4.57%	62,743	4.70%

036	79,746	-264	-0.33	8.66%	61,859	8.13%
037	80,255	245	0.31	7.54%	63,480	7.44%
038	80,758	748	0.93	9.47%	62,463	8.92%
039	80,710	700	0.87	9.15%	61,870	8.64%
040	80,729	719	0.90	6.12%	58,415	6.15%
041	80,792	782	0.98	5.57%	60,765	5.38%
042	79,964	-46	-0.06	9.84%	58,066	9.27%
043	80,750	740	0.92	17.03%	62,318	16.34%
044	80,796	786	0.98	21.28%	59,112	21.10%
045	80,240	230	0.29	11.42%	67,692	10.85%
046	80,333	323	0.40	27.49%	66,262	26.57%
047	80,757	747	0.93	4.64%	68,384	4.54%
048	79,492	-518	-0.65	4.00%	64,068	4.24%
049	80,609	599	0.75	16.56%	66,373	15.86%
050	80,677	667	0.83	13.11%	55,689	13.32%
051	80,372	362	0.45	15.03%	58,448	14.61%
052	79,290	-720	-0.90	29.05%	56,592	28.81%
053	80,049	39	0.05	5.09%	62,827	4.99%
054	80,155	145	0.18	17.28%	57,249	17.02%
055	79,578	-432	-0.54	15.89%	59,680	16.36%
056	79,271	-739	-0.92	11.80%	58,745	12.72%
057	80,778	768	0.96	16.96%	68,024	15.29%
058	80,767	757	0.95	6.49%	61,395	6.67%
059	79,345	-665	-0.83	19.61%	62,208	19.77%
060	79,219	-791	-0.99	33.40%	62,712	32.17%
061	79,792	-218	-0.27	33.48%	63,280	33.18%
062	79,677	-333	-0.42	24.54%	61,022	23.81%
063	79,602	-408	-0.51	58.79%	61,404	58.55%
064	79,262	-748	-0.93	24.09%	61,722	23.91%
065	79,364	-646	-0.81	13.54%	59,232	14.37%
066	79,397	-613	-0.77	16.74%	58,534	15.58%
067	79,633	-377	-0.47	5.25%	57,154	5.28%
068	79,611	-399	-0.50	7.04%	63,752	6.91%
069	79,386	-624	-0.78	57.17%	62,538	54.20%
070	79,382	-628	-0.78	57.39%	58,654	55.42%
071	80,322	312	0.39	59.17%	66,230	54.44%
072	80,764	754	0.94	13.19%	62,008	12.96%
073	80,135	125	0.16	13.57%	63,116	12.92%
074	79,594	-416	-0.52	59.16%	60,478	56.47%
075	79,295	-715	-0.89	55.57%	63,445	55.10%
076	80,313	303	0.38	25.24%	59,747	24.66%
077	79,627	-383	-0.48	59.84%	57,841	57.92%
078	80,475	465	0.58	16.14%	60,410	16.60%
079	80,243	233	0.29	29.73%	66,796	28.31%
080	80,705	695	0.87	57.70%	60,871	55.48%
081	79,438	-572	-0.71	18.09%	59,833	18.00%

082	80,463	453	0.57	9.15%	63,348	8.48%
083	79,538	-472	-0.59	15.44%	62,818	14.39%
084	80,281	271	0.34	19.49%	58,742	19.43%
085	80,800	790	0.99	19.07%	62,188	18.06%
086	80,747	737	0.92	7.60%	59,286	7.84%
087	79,275	-735	-0.92	7.88%	55,787	8.09%
088	80,191	181	0.23	13.97%	58,354	13.44%
089	79,614	-396	-0.49	56.91%	61,070	54.30%
090	80,425	415	0.52	57.50%	60,204	55.17%
091	79,229	-781	-0.98	19.41%	59,281	18.90%
092	79,689	-321	-0.40	60.33%	61,309	59.28%
093	79,211	-799	-1.00	23.08%	62,539	21.56%
094	79,429	-581	-0.73	21.36%	62,412	20.11%
095	80,071	61	0.08	60.44%	59,017	58.44%
096	79,217	-793	-0.99	13.59%	61,067	13.30%
097	79,386	-624	-0.78	10.47%	60,024	10.65%
098	79,251	-759	-0.95	16.22%	62,740	16.16%
099	80,332	322	0.40	24.46%	63,534	23.71%
100	80,037	27	0.03	28.29%	63,027	26.90%

Total Population: 8,001,024

Ideal District Population: 80,010

Summary Statistics

Population Range: 79,210 to 80,800

Ratio Range: 0.02

Absolute Range: -800 to 790

Absolute Overall Range: 1,590.00

Relative Range: -1.00% to 0.99%

Relative Overall Range: 1.99%

Absolute Mean Deviation: 497.16

Relative Mean Deviation: 0.62%

Standard Deviation: 547.62

Population Summary Report

Thursday April 9, 2015 2:18PM

Plan: vaLD_DLS-PLAN-3e_PROP-HB5001-Conference_od09a
Plan Type:
Administrator:
User:

DIST-RICT	POPU-LATION	DEVI-ATION	%DE-VN	[%NHB-POP]	TOTVAP	[%NHB-VAP]
001	80,508	498	0.62	3.21%	64,221	3.70%
002	79,491	-519	-0.65	23.50%	56,163	23.19%
003	80,583	573	0.72	2.71%	64,745	2.91%
004	80,446	436	0.54	1.84%	64,195	2.05%
005	80,600	590	0.74	2.69%	64,337	2.54%
006	79,608	-402	-0.50	1.85%	62,988	1.84%
007	80,146	136	0.17	3.85%	64,401	3.79%
008	80,685	675	0.84	3.98%	63,208	3.79%
009	80,574	564	0.70	9.69%	64,142	9.78%
010	80,073	63	0.08	8.01%	56,543	8.16%
011	80,132	122	0.15	32.63%	62,356	30.37%
012	80,492	482	0.60	4.19%	69,034	4.12%
013	80,579	569	0.71	12.47%	58,290	12.42%
014	79,407	-603	-0.75	35.79%	62,379	33.86%
015	80,630	620	0.77	1.80%	62,907	1.74%
016	79,692	-318	-0.40	27.28%	63,086	26.83%
017	80,631	621	0.78	6.30%	63,576	5.82%
018	79,450	-560	-0.70	7.09%	59,686	7.40%
019	80,080	70	0.09	5.74%	62,844	5.74%
020	79,334	-676	-0.84	8.26%	62,717	7.91%
021	79,608	-402	-0.50	23.34%	58,656	22.83%
022	79,307	-703	-0.88	21.34%	61,467	20.20%
023	79,330	-680	-0.85	15.68%	63,982	14.61%
024	79,678	-332	-0.41	8.03%	64,424	8.30%
025	80,011	1	0.00	3.33%	61,585	3.42%
026	80,688	678	0.85	4.08%	65,566	3.90%
027	79,238	-772	-0.96	18.48%	59,052	17.40%
028	79,304	-706	-0.88	18.21%	58,388	17.41%
029	80,185	175	0.22	5.82%	61,678	5.61%
030	80,583	573	0.72	14.57%	61,276	14.68%
031	79,210	-800	-1.00	19.46%	56,743	19.25%
032	80,268	258	0.32	7.12%	55,263	7.42%
033	80,760	750	0.94	4.67%	57,289	4.67%
034	80,722	712	0.89	3.14%	57,978	3.28%

035	80,213	203	0.25	4.57%	62,743	4.70%
036	79,746	-264	-0.33	8.66%	61,859	8.13%
037	80,255	245	0.31	7.54%	63,480	7.44%
038	80,758	748	0.93	9.47%	62,463	8.92%
039	80,710	700	0.87	9.15%	61,870	8.64%
040	80,729	719	0.90	6.12%	58,415	6.15%
041	80,792	782	0.98	5.57%	60,765	5.38%
042	79,964	-46	-0.06	9.84%	58,066	9.27%
043	80,750	740	0.92	17.03%	62,318	16.34%
044	80,796	786	0.98	21.28%	59,112	21.10%
045	80,240	230	0.29	11.42%	67,692	10.85%
046	80,333	323	0.40	27.49%	66,262	26.57%
047	80,757	747	0.93	4.64%	68,384	4.54%
048	79,492	-518	-0.65	4.00%	64,068	4.24%
049	80,609	599	0.75	16.56%	66,373	15.86%
050	80,677	667	0.83	13.11%	55,689	13.32%
051	80,372	362	0.45	15.03%	58,448	14.61%
052	79,290	-720	-0.90	29.05%	56,592	28.81%
053	80,049	39	0.05	5.09%	62,827	4.99%
054	80,155	145	0.18	17.28%	57,249	17.02%
055	79,578	-432	-0.54	15.89%	59,680	16.36%
056	79,271	-739	-0.92	11.80%	58,745	12.72%
057	80,778	768	0.96	16.96%	68,024	15.29%
058	80,767	757	0.95	6.49%	61,395	6.67%
059	79,345	-665	-0.83	19.61%	62,208	19.77%
060	79,219	-791	-0.99	33.40%	62,712	32.17%
061	79,792	-218	-0.27	33.48%	63,280	33.18%
062	79,509	-501	-0.63	23.66%	61,088	22.94%
063	79,602	-408	-0.51	58.79%	61,404	58.55%
064	79,262	-748	-0.93	24.09%	61,722	23.91%
065	79,263	-747	-0.93	13.28%	59,022	14.17%
066	79,397	-613	-0.77	16.74%	58,534	15.58%
067	79,633	-377	-0.47	5.25%	57,154	5.28%
068	80,651	641	0.80	7.15%	64,630	7.04%
069	79,305	-705	-0.88	57.54%	62,448	54.54%
070	79,384	-626	-0.78	58.59%	58,447	56.76%
071	79,773	-237	-0.30	59.54%	65,722	54.82%
072	80,764	754	0.94	13.19%	62,008	12.96%
073	80,135	125	0.16	13.57%	63,116	12.92%
074	79,594	-416	-0.52	59.16%	60,478	56.47%
075	79,295	-715	-0.89	55.57%	63,445	55.10%
076	80,313	303	0.38	25.24%	59,747	24.66%
077	79,627	-383	-0.48	59.84%	57,841	57.92%
078	80,475	465	0.58	16.14%	60,410	16.60%
079	80,243	233	0.29	29.73%	66,796	28.31%
080	80,705	695	0.87	57.70%	60,871	55.48%

081	79,438	-572	-0.71	18.09%	59,833	18.00%
082	80,463	453	0.57	9.15%	63,348	8.48%
083	79,538	-472	-0.59	15.44%	62,818	14.39%
084	80,281	271	0.34	19.49%	58,742	19.43%
085	80,800	790	0.99	19.07%	62,188	18.06%
086	80,747	737	0.92	7.60%	59,286	7.84%
087	79,275	-735	-0.92	7.88%	55,787	8.09%
088	80,191	181	0.23	13.97%	58,354	13.44%
089	80,520	510	0.64	57.35%	61,584	54.65%
090	79,519	-491	-0.61	57.07%	59,690	54.82%
091	79,229	-781	-0.98	19.41%	59,281	18.90%
092	79,689	-321	-0.40	60.33%	61,309	59.28%
093	79,211	-799	-1.00	23.08%	62,539	21.56%
094	79,429	-581	-0.73	21.36%	62,412	20.11%
095	80,071	61	0.08	60.44%	59,017	58.44%
096	79,217	-793	-0.99	13.59%	61,067	13.30%
097	79,386	-624	-0.78	10.47%	60,024	10.65%
098	79,251	-759	-0.95	16.22%	62,740	16.16%
099	80,332	322	0.40	24.46%	63,534	23.71%
100	80,037	27	0.03	28.29%	63,027	26.90%

Total Population: 8,001,024

Ideal District Population: 80,010

Summary Statistics

Population Range: 79,210 to 80,800

Ratio Range: 0.02

Absolute Range: -800 to 790

Absolute Overall Range: 1,590.00

Relative Range: -1.00% to 0.99%

Relative Overall Range: 1.99%

Absolute Mean Deviation: 505.64

Relative Mean Deviation: 0.63%

Standard Deviation: 556.40

Population Summary Report

Thursday April 9, 2015 2:50 PM

Plan: vaLD_DLS-PLAN-6b_PROP-HB5005-SenSub_od09b
Plan Type:
Administrator:
User:

DIST-RICT	POPU-LATION	DEVI-ATION	%DE-VN	[%NHB-POP]	TOTVAP	[%NHB-VAP]
001	80,508	498	0.62	3.21%	64,221	3.70%
002	79,491	-519	-0.65	23.50%	56,163	23.19%
003	80,583	573	0.72	2.71%	64,745	2.91%
004	80,446	436	0.54	1.84%	64,195	2.05%
005	80,600	590	0.74	2.69%	64,337	2.54%
006	79,608	-402	-0.50	1.85%	62,988	1.84%
007	80,146	136	0.17	3.85%	64,401	3.79%
008	80,685	675	0.84	3.98%	63,208	3.79%
009	80,574	564	0.70	9.69%	64,142	9.78%
010	80,617	607	0.76	8.04%	57,050	8.18%
011	80,132	122	0.15	32.63%	62,356	30.37%
012	80,492	482	0.60	4.19%	69,034	4.12%
013	80,579	569	0.71	12.47%	58,290	12.42%
014	79,407	-603	-0.75	35.79%	62,379	33.86%
015	80,630	620	0.77	1.80%	62,907	1.74%
016	79,692	-318	-0.40	27.28%	63,086	26.83%
017	80,631	621	0.78	6.30%	63,576	5.82%
018	79,450	-560	-0.70	7.09%	59,686	7.40%
019	80,080	70	0.09	5.74%	62,844	5.74%
020	79,334	-676	-0.84	8.26%	62,717	7.91%
021	79,608	-402	-0.50	23.34%	58,656	22.83%
022	79,307	-703	-0.88	21.34%	61,467	20.20%
023	79,330	-680	-0.85	15.68%	63,982	14.61%
024	79,678	-332	-0.41	8.03%	64,424	8.30%
025	80,011	1	0.00	3.33%	61,585	3.42%
026	80,688	678	0.85	4.08%	65,566	3.90%
027	79,381	-629	-0.79	18.91%	58,981	17.89%
028	79,304	-706	-0.88	18.21%	58,388	17.41%
029	79,851	-159	-0.20	5.75%	61,320	5.56%
030	80,583	573	0.72	14.57%	61,276	14.68%
031	79,210	-800	-1.00	19.46%	56,743	19.25%
032	80,268	258	0.32	7.12%	55,263	7.42%
033	80,550	540	0.67	4.68%	57,140	4.68%
034	80,722	712	0.89	3.14%	57,978	3.28%
035	80,213	203	0.25	4.57%	62,743	4.70%

036	79,746	-264	-0.33	8.66%	61,859	8.13%
037	80,255	245	0.31	7.54%	63,480	7.44%
038	80,758	748	0.93	9.47%	62,463	8.92%
039	80,710	700	0.87	9.15%	61,870	8.64%
040	80,729	719	0.90	6.12%	58,415	6.15%
041	80,792	782	0.98	5.57%	60,765	5.38%
042	79,964	-46	-0.06	9.84%	58,066	9.27%
043	80,750	740	0.92	17.03%	62,318	16.34%
044	80,796	786	0.98	21.28%	59,112	21.10%
045	80,240	230	0.29	11.42%	67,692	10.85%
046	80,333	323	0.40	27.49%	66,262	26.57%
047	80,757	747	0.93	4.64%	68,384	4.54%
048	79,492	-518	-0.65	4.00%	64,068	4.24%
049	80,609	599	0.75	16.56%	66,373	15.86%
050	80,677	667	0.83	13.11%	55,689	13.32%
051	80,372	362	0.45	15.03%	58,448	14.61%
052	79,290	-720	-0.90	29.05%	56,592	28.81%
053	80,049	39	0.05	5.09%	62,827	4.99%
054	80,155	145	0.18	17.28%	57,249	17.02%
055	79,578	-432	-0.54	15.89%	59,680	16.36%
056	79,271	-739	-0.92	11.80%	58,745	12.72%
057	80,778	768	0.96	16.96%	68,024	15.29%
058	80,767	757	0.95	6.49%	61,395	6.67%
059	79,345	-665	-0.83	19.61%	62,208	19.77%
060	79,219	-791	-0.99	33.40%	62,712	32.17%
061	79,792	-218	-0.27	33.48%	63,280	33.18%
062	79,677	-333	-0.42	24.54%	61,022	23.81%
063	79,602	-408	-0.51	58.79%	61,404	58.55%
064	79,262	-748	-0.93	24.09%	61,722	23.91%
065	79,364	-646	-0.81	13.54%	59,232	14.37%
066	79,397	-613	-0.77	16.74%	58,534	15.58%
067	79,633	-377	-0.47	5.25%	57,154	5.28%
068	79,611	-399	-0.50	7.04%	63,752	6.91%
069	79,386	-624	-0.78	57.17%	62,538	54.20%
070	79,382	-628	-0.78	57.39%	58,654	55.42%
071	80,322	312	0.39	59.17%	66,230	54.44%
072	80,764	754	0.94	13.19%	62,008	12.96%
073	80,135	125	0.16	13.57%	63,116	12.92%
074	79,594	-416	-0.52	59.16%	60,478	56.47%
075	79,295	-715	-0.89	55.57%	63,445	55.10%
076	80,313	303	0.38	25.24%	59,747	24.66%
077	79,627	-383	-0.48	59.84%	57,841	57.92%
078	80,475	465	0.58	16.14%	60,410	16.60%
079	80,243	233	0.29	29.73%	66,796	28.31%
080	80,705	695	0.87	57.70%	60,871	55.48%
081	79,438	-572	-0.71	18.09%	59,833	18.00%

082	80,463	453	0.57	9.15%	63,348	8.48%
083	79,538	-472	-0.59	15.44%	62,818	14.39%
084	80,281	271	0.34	19.49%	58,742	19.43%
085	80,800	790	0.99	19.07%	62,188	18.06%
086	80,747	737	0.92	7.60%	59,286	7.84%
087	79,275	-735	-0.92	7.88%	55,787	8.09%
088	80,191	181	0.23	13.97%	58,354	13.44%
089	79,614	-396	-0.49	56.91%	61,070	54.30%
090	80,425	415	0.52	57.50%	60,204	55.17%
091	79,229	-781	-0.98	19.41%	59,281	18.90%
092	79,689	-321	-0.40	60.33%	61,309	59.28%
093	79,211	-799	-1.00	23.08%	62,539	21.56%
094	79,429	-581	-0.73	21.36%	62,412	20.11%
095	80,071	61	0.08	60.44%	59,017	58.44%
096	79,217	-793	-0.99	13.59%	61,067	13.30%
097	79,386	-624	-0.78	10.47%	60,024	10.65%
098	79,251	-759	-0.95	16.22%	62,740	16.16%
099	80,332	322	0.40	24.46%	63,534	23.71%
100	80,037	27	0.03	28.29%	63,027	26.90%

Total Population: 8,001,024

Ideal District Population: 80,010

Summary Statistics

Population Range: 79,210 to 80,800

Ratio Range: 0.02

Absolute Range: -800 to 790

Absolute Overall Range: 1,590.00

Relative Range: -1.00% to 0.99%

Relative Overall Range: 1.99%

Absolute Mean Deviation: 500.34

Relative Mean Deviation: 0.63%

Standard Deviation: 548.43